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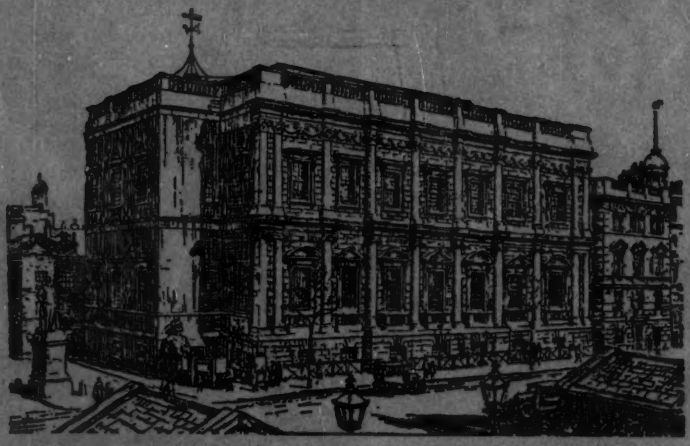

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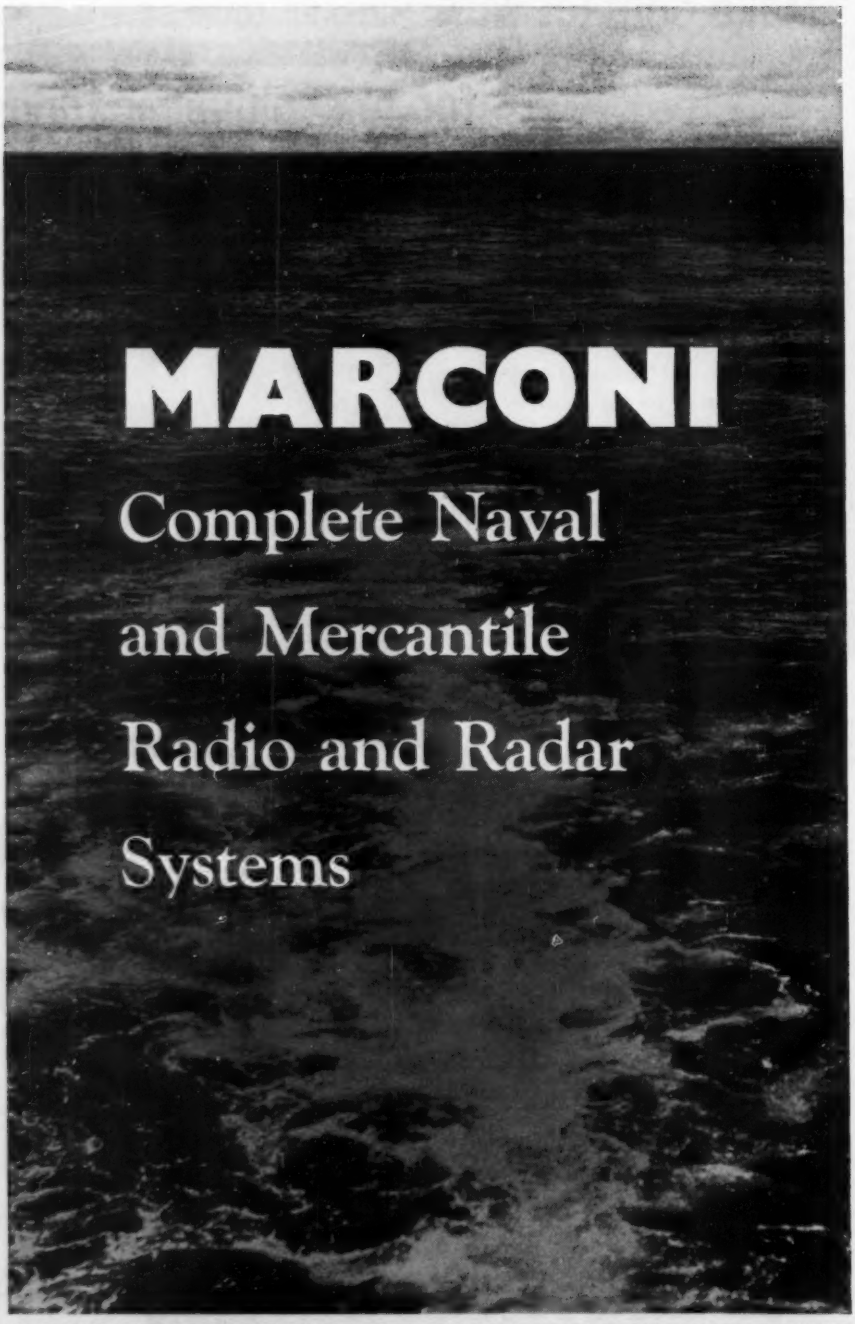

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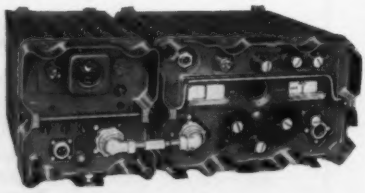

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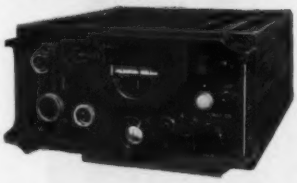

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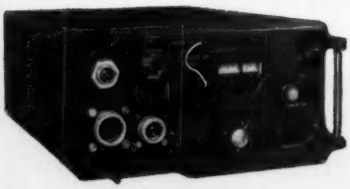

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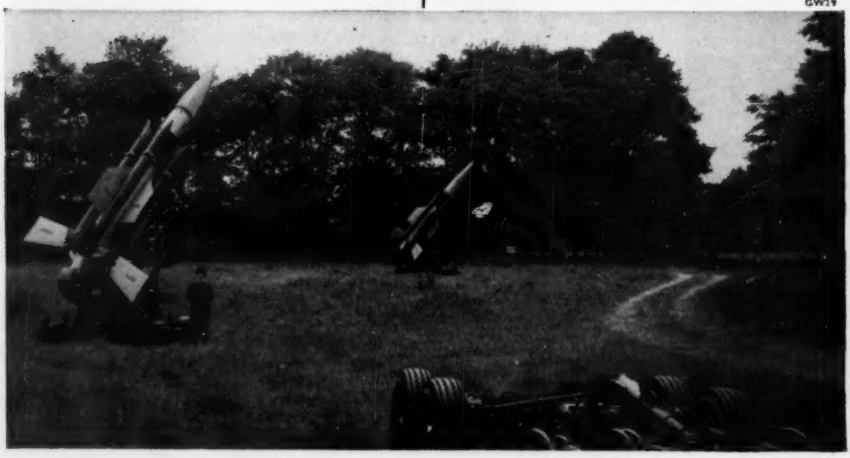

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of the

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Vol. CV **NOVEMBER, 1960** **No. 620**

EDITOR'S NOTES

ONE of the perennial problems which crops up to tease the Services from time to time is the relation of the armed forces to the probable or possible shape of future war within the political framework of national policy. Policy, or at least the formulation of policy, is in no way the concern of the Services, except possibly in so far as the size and capability of the national defence forces may dictate policy. As an illustration of this, we need look back no further than 1938, when a Chiefs of Staff paper on the operational deficiencies of the three Services tied Mr. Chamberlain's hands at Munich and forced upon him the delaying tactics which have since been castigated so violently as a surrender to international blackmail.

Although the Services have no active hand in the formulation of policy on the national and international scale, they are nevertheless the instruments through which a designed policy is put into practice, either actively, in the shape of war, or passively, as the backing which makes a particular policy viable. It follows naturally that the Services, being the experts within their respective fields, have to translate the national policy into concrete terms of men and weapons. This has to be done not only within the political but also within the economic climate of the day. In those countries where the national policy tends to be rigid, as for example in the United States and France, the particular Service problems of men and weapons are relatively easy. Where a more supple policy is adopted, as in Great Britain and many of the Commonwealth countries, such problems are infinitely more difficult, for they need to be weighed continually against the changing patterns of foreign policy.

These are self-evident truths which really need no reiteration, but they are engendered at this moment by the growing evidence of two distinct and diverging trends in foreign policy. For those who have read and studied the lessons of recent history, a comparison of the situation in this country today with the situation which existed in the 1930s bears many startling similarities, and we must never forget that the ultimate and inevitable development of that particular situation was the second great war.

For those whose memories do not stretch back into the 1930s, it can perhaps be explained that in those years the natural human revulsion to war was emotionally stampeded, through the organization of a " Peace Ballot," into a political expression of belief in unilateral disarmament of such dimensions that the responsible statesmen of the day were unable, or unwilling, to stand out against the flood. Because of that unwillingness, the shape of our forces, in relation to the potential dangers of the external situation in Europe as it was then, was trimmed to the point where it became

an open invitation to war. Hence that Chiefs of Staff paper mentioned above, which led to the deplorable showdown at Munich. This, of course, is somewhat of an over-simplification of the whole situation, but it is broadly true.

What we are seeing now is something very like a repetition of that particular episode in our recent history. The present campaign for nuclear disarmament bears a striking resemblance to the early developments in the campaign in the thirties which finally resulted in the " Peace Ballot," and the impression made on official party policy at the recent Labour Party conference at Scarborough by the size of the unilateralist vote strikes a similar chord of remembrance in the pacifist votes of thirty years ago. This is not to say, of course, that the present campaign is certain to develop on similar lines, but it would not be the first time that history has repeated itself. Indeed, this exact lesson has been demonstrated in history many times.

It is in this particular context that the task of the Services today is a singularly difficult one. The complexities of modern war make it quite impossible to plan on a short-term basis; today's decisions do not begin to bear their full fruit for some years ahead. It is for this reason that a degree of stability in national policy is an essential condition of adequate Service planning. What is needed is a long-term certainty that the present pattern of alliances on which our current national defence is based will continue to form a solid foundation on which our armed Services can be shaped and designed to play their part. This was until recently securely ensured by the largely bi-partisan foreign policy of the only two political parties from which any government in this country could be formed. Now we no longer have this bi-partisan policy, and a change of opinion at the national polls might well endanger the only foundation on which Service planning, in the shape of men and weapons, can be confidently and sensibly based.

Unfortunately, over the majority of mankind, emotion is always a stronger force than reason. The " success " of the " Peace Ballot " was due basically to the fact that men's emotions were harnessed to produce a thumping majority. In the present campaign for nuclear disarmament, and its allied campaign for unilateralism, the appeal is once again to the emotions. Last time, as a nation, we succumbed, and paid the penalty in six years of hideous war. This time ?

* * *

There has been some play in the Press, both in this country and in the United States, on the evidences of strain which are appearing in the relations between Russia and China. There have even been suggestions, quite seriously discussed, that Mr. Khruschev is beginning to believe that China may develop into a more real danger to his particular brand of Communism than the nations of the West.

It is an attractive proposition, but on such facts of the case as are generally available it is a proposition which holds no water at all. Of course there are differences; for Mr. Chou-en-lai (quite apart from his outstripping even of Stalin in developing the ' cult of personality ') must be the most difficult and awkward of bedfellows to all who seek to lie with him in amity, if only for his personal ruthlessness and complete disregard of all the rules of the international game. But we should require much more evidence than we yet have of a real disagreement before we begin to count any chicken emerging from this particular egg. Even in the Communist hierarchy, in which many strange things may happen, the whole is always greater than the part. If the crunch really came, the odds are still very heavily in favour of finding Mr. K. and Mr. C. between the same pair of sheets.

Such danger as there is in the Chinese situation undoubtedly lies in the not so very distant future when China achieves the nuclear break-through. It is not to be doubted that all the present nuclear Powers, including Russia, are vividly aware of the final effect of nuclear bombardment, and that none of them can contemplate casualties on a scale which would with certainty border on complete extinction. Except China. Mr. Chou-en-lai is known to be a fanatic to whom the end is infinitely more important than the means. If he thought he could see the end triumphant, even at the cost of five hundred million Chinese lives in a nuclear holocaust, he would not hesitate.

It is there that Mr. Khruschev's real dilemma lies. And it is only at that moment of time that we may yet see a parting of the ways.

* * *

We make no apologies for printing in this issue of the JOURNAL an article which has only recently appeared in a book. The article did in fact reach us before the book was published, but for several reasons had to be held over.

It deals, however, with so important a subject that its reissue in our pages is, we believe, fully justified. As one of the principal maritime nations in the world, it is quite extraordinary that we have never taken the trouble to develop the one weapon which it is in our power to use with really devastating effect. Of all the operations of war, amphibious assault is possibly the most difficult but certainly the most effective. It is this aspect of war which Captain Liddell Hart discusses in an article that we believe deserves wide and earnest study.

STRATEGIC DETERRENCE IN THE 1960s

By Group Captain P. de L. le Cheminant, D.F.C.

PROFESSOR BRODIE'S latest book,[1] and Sir John Slessor's review of it in the March–April, 1960, issue of *Survival*[2] make a fascinating contrast and seem to point the main differences between the line of thought of American and British writers on the complex and controversial subject of strategic deterrence. The word 'seem' is used advisedly, because although American writers on this subject appear to have reached a fair measure of unanimity, it is difficult to discern a corresponding British (or for that matter European) view. The whole approach to this problem has been quite different on the two sides of the Atlantic. American books and articles on what Sir John Slessor calls "these appallingly complex problems" have excited remarkably little comment in this country, and for that reason it is felt that an attempt (which might otherwise be presumptuous) to summarize the existing position and to offer some comment on outstanding points, may not be altogether out of place.

The first point worth making, which bears both on the difference in approach and the greater volume of American writing, is that a circle of professional lay strategists has emerged in America which has no counterpart in this country or on the Continent. This has resulted from the American approach to Operational Research. The basic British idea of O.R.S. has been elaborated and expanded and, instead of each Service maintaining its own scientific cell, the Americans have, as it were, put Operational Research and Systems Analysis out to contract. Thus the Massachusetts Institute of Technology provides the Operations Evaluation Group for the Navy, Johns Hopkins University runs the Operations Research Office for the Army, while the R.A.N.D. Corporation provides a similar service for the Air Force. The Institute of Defence Analysis is likewise linked to the Joint Chiefs of Staff. The staff of the R.A.N.D. Corporation, with its Air Force affiliations, has naturally had the most to say on the subject of strategic deterrence.

The existence of these intellectual strategists probably goes a long way to account for the preponderance of American writing in this field though there are, of course, other reasons. Perhaps the most important of these is the fact of physical possession of the major part of the Western deterrent. The problems of strategic deterrence must, for this reason, inevitably tend to loom larger in American eyes than they do in our own. Next in importance, one suspects, is the disturbing novelty of a strategic situation in which the North American continent is itself threatened. Lastly, though not without considerable influence, could be the American sense of mission and responsibility as the military leader of the free world. Viewed in this light the quantitative unbalance in writing does not seem altogether remarkable, but what of the difference in approach? What is this difference, and how can it be explained?

Briefly, it is suggested that the British approach has been instinctive and intuitive—a matter of judgment—whilst that of the Americans has been essentially objective and analytical. There has, on the American side, been a preoccupation—almost an obsession—with numbers; a desire to rationalize the problem and reduce it to mathematical terms. In its extreme form—not subscribed to by Dr. Brodie, nor by the R.A.N.D. Corporation in general—this preoccupation has tended to produce what Sir John has called "slide-rule strategy." On this, he has some trenchant

[1] *Strategy in the Missile Age.*

[2] Published by the Institute for Strategic Studies.

comment. " It is simple," he writes, " to work out a nice sum to prove that a given number of hydrogen warheads with an assumed yield and accuracy of delivery would be bound to destroy every manned bomber and missile in the West. But here perhaps is where mature military judgment may be a useful partner to analytical brilliance. It is not really as easy as that in practice—things in war just don't work out that way. One has seen in war these sort of calculations so constantly—almost invariably—falsified in the event, one way or another, and I think this is one of the relatively few lessons of pre-nuclear military history which is unlikely to be misleading."

British writers, by way of contrast, have tended to the opposite extreme of ignoring numbers altogether. In attempting to summarize this attitude in another article,[3] I used the words: " The general (i.e. British) view would seem to be that there is no need for mathematical precision in this matter, and that the very existence of a nuclear capability will continue to suffice in producing unacceptable uncertainty in the mind of an aggressor."

This summary, as a generalization, still seems to me to be accurate. Where numbers have been considered it has almost invariably been in terms of pre-strike order of battle. Newspaper articles speculating, for example, on the alleged American lag in I.C.B.M.s have used such terms as " Atlas and Minuteman redressing the balance," and have shown concern not with the potential vulnerability of either of these weapons but with the number likely to be introduced into the front line. These ' inventory numbers ' are of course of prime importance only in a ' strike first ' or preventive war context—a concept which has no support on either side of the Atlantic. This is a common misconception, and one which a member of the R.A.N.D. Corporation drew attention to in a recent article[4]; " Typically, discussions of the capability of the United States to deter a direct attack compare the pre-attack inventory of our forces with the pre-attack inventory of the Russian forces—that is, the numbers of planes, missiles, army divisions, and submarines of the two countries are directly compared. This is a World War I and World War II approach. The really essential numbers, however, are estimates of the damage that the retaliatory forces can inflict after being hit."

Professor Brodie parallels this thought when he writes ". . . the public agitation early in 1959 concerning the so-called ' missile gap ' remained persistently focused on secondary issues. We need not and should not have permitted the Russians to outdistance us in this important field, but the question whether we had as many or as good missiles as them was far less vital than the question: was our retaliatory force, whether aircraft or missiles, suitably protected against Soviet missiles?" But this desire on the part of American writers to ' put the numbers into the problem ' is only one, though perhaps the most noticeable, of the differences in approach. Just as clear-cut, and on similar lines, is the American suspicion of any opinion or theory founded on experience or intuition. The more popular and ' obviously right ' the theory, the greater the suspicion and, in due course, the colder the logic with which it is dissected and exposed as fallacious.

One practical effect of this shying away from axioms is that American writing is, by and large, far less optimistic than British. A good example of this is, perhaps, the commonly held British view that there is a strategic nuclear stalemate, and that this condition will continue to exist. One might even go so far as to say that this view is

[3] "Soviet Military Doctrine—A Possible Pattern of War. "*Brassey's Annual*, 1959.

[4] "The Feasibility of War and Deterrence," Herman Kahn. Reprinted in *Survival*, Mar.—Apr., 1960.

an article of faith, a basic belief common to all British military thought. The R.U.S.I. Prize Essay subject for 1960, for example—which is a good guide in these matters—starts with the flat statement, " the thermo-nuclear stalemate makes a major war out of the question." In the course of a long and brilliant analysis[5] of this particular problem, Albert Wohlstetter, also of the R.A.N.D. Corporation, had this to say; " I emphasize that requirements for deterrence are stringent. We have heard so much about the atomic stalemate and the receding probability of war which it has produced that this may strike the reader as something of an exaggeration. Is deterrence a necessary consequence of both sides having a nuclear delivery capability, and is all-out war nearly obsolete ? Is mutual extinction the only outcome of a general war ? This belief, frequently expressed by references to Mr. Oppenheimer's simile of the two scorpions in a bottle, is perhaps the prevalent one. It is held by a very eminent and diverse group of people—in England by Sir Winston Churchill, P. M. S. Blackett, Sir John Slessor, Admiral Buzzard, and many others; in France by such figures as Raymond Aron, General Gallois, and General Gazin; in this country by the titular heads of both parties as well as almost all writers on military and foreign affairs, by both Henry Kissinger and his critic, James E. King, Jr., and by George Kennan as well as Dean Acheson. Mr. Kennan refers to American concern about surprise attack as simply obsessive. . . . If peace were founded firmly on mutual terror, and mutual terror on symmetrical nuclear capabilities, this would be, as Churchill has said, ' a melancholy paradox '; none the less a most comforting one. Deterrence, however, is not automatic. While feasible, it will be much harder to achieve in the 1960s than is generally believed. One of the most disturbing features of current opinion is the underestimation of this difficulty. This is due partly to a misconstruction of the technological race as a problem in matching striking forces, partly to a wishful analysis of the Soviet ability to strike first."

Professor Brodie's book, which was written as a R.A.N.D. Corporation project, owes much, in his own words, to " a general environment of thought within the organization." It is not surprising, therefore, to find that he fully shares Dr. Wohlstetter's reservations about the stability of the strategic situation. This is a subject to which it will be necessary to return later in this article, but it may serve to illustrate what I have called elsewhere " that special air of scientific pessimism and analytical gloom which is the hallmark of the genuine R.A.N.D. product ! "

The third main difference in approach is closely related to the second in that it is part and parcel of the objective scientific method; I refer to the clinical impartiality and coldness with which each idea or statement is probed and tested. This reluctance to make a self-evident statement is inclined to lead to an involved analysis which can become tiresome to a non-scientific mind. Dr. Brodie's way of saying " we would be well advised to recognize that we simply don't know, and have no way of knowing, whether there will be total war between East and West " seems, with respect, to provide a good example of what I mean. He writes; " We now have to face the question of the probability of total war between the two major power centres of the world. It is a difficult question to deal with reasonably, because we all know that the future remains inscrutable and that logic and reason may lead us to the kind of ' correct ' answer which has every merit except that of being confirmed by events. Even if we could prove, as we cannot, that total war is not inevitable or even very likely in the near future, it might still happen. It might still happen even if we knew the statistical chances of it occurring to be quite low; we are after all talking about a

[5] "The Delicate Balance of Terror," *Foreign Affairs*, Jan., 1959.

unique event, which by definition is almost bound to be an aberrant from any statistical indication of its probability. Since we cannot, in any satisfactory objective way, prove that the chances are very high or very low or somewhere in between, it may be more meaningful, from the policy making point of view, simply to recognize that we have no guarantee either that it will happen or that it will not happen."

So much then for the main differences in approach. It is suggested that they are the result of three main things; first, that the bulk of American writers in this field are scientists, with trained analytical minds, accustomed to the processing of facts rather than the weighing of argument. For them, military judgment or any form of intuitive reasoning is suspect and, as a currency, is not legal tender. Secondly, as already suggested, the physical possession of the bulk of the Western deterrent must inevitably tend to bring the writers ' down to cases.' They are dealing with facts, or potential facts, rather than with abstract theories, and it is almost inevitable that this should tend to produce a more practical approach. Lastly, it is suggested that national outlook and characteristics may not have been without effect in moulding the two distinctive methods of approach.

The net result is an American line of thought which is at once more sceptical and less optimistic than its British equivalent. As such it is salutary. It is suggested that it has two weaknesses. The first lies in the fact that logic is not always a good yardstick against which to assess future human behaviour; as already quoted ". . . logic and reason may lead us to the kind of ' correct ' answer which has every merit except that of being confirmed by events." Professor Brodie again recognizes this weakness when he writes, " The truth, unfortunately, is that the profound issues in strategy, those likely to affect most deeply the fates of nations and even of mankind, are precisely those which do not lend themselves to scientific analysis." What then, it may be asked, is the value and point of all this careful analysis, all this focusing of trained minds on the problem, if it is admitted that a solution cannot be found by this method ? It is not easy to demonstrate the value of such work, as much of it lies in its effect on the mind of decision-makers, and cannot therefore be measured. As the various aspects of the problem are worked over, and new situations postulated, it is inevitable that those concerned become increasingly familiar with their medium and are able to demonstrate, with conviction, that certain things are possible whilst others are not. They also, by their familiarity with the problem as a whole, acquire an insight into factors critical to the West, which might otherwise not be given their full values. The work is therefore capable of providing guidance on both broad and particular issues and, properly used, could be invaluable.

There is, of course, inevitably the strong possibility that some politicians will take either too little or too much notice of work in this field. On the one hand they are exposed to the seduction of the persuasive commentator and might, to take an extreme example, find a view such as that expressed by Mr. Rovere[6] appealing both to their own intuitive judgment of military affairs and to their estimate of what the nation can afford for defence. Mr. Rovere wrote: " If the Russians had 10,000 warheads and a missile for each, and we had ten hydrogen bombs and ten obsolete bombers . . . aggression would still be a folly that would appeal only to an insane adventurer."

In this particular instance Albert Wohlstetter conclusively demonstrated the fallacy of this argument in an article[7] which received very wide attention. This is a

[6] Quoted in "The Delicate Balance of Terror," Albert Wohlstetter, *Foreign Affairs*, Jan., 1959.

[7] Ibid.

valid and most practical application of the work which has been done, and one which, in time, may build up a body of informed opinion too large for a politician to ignore. What of the politicians who are liable to take too much notice of work in this field? These are the men—and the list, both actual and potential, is not small—who, with no military or scientific training, suddenly discover that they are born strategists. These men are the 'gimmick' merchants and the panacea addicts, who are likely to bring too much enthusiasm and too little understanding to their interpretation of the relevant studies.

It is interesting to speculate as to whether it was civilian advisers in this mould or their military counterparts who were responsible for formulating the damaging and unrealistic elements of the 'massive retaliation' policy launched by Mr. Dulles in 1954. By implication, Professor Brodie's money is on the military. "It is noteworthy that while the January 12th speech was a major policy declaration by a senior civilian member of the government, the justifications it presented for the new doctrine appealed in the main to certain characteristically military ideas or doctrines." He may well be right, though the fact that this new policy was to be cheaper than the old makes one look with suspicion in the direction of the politicians. Either way, bad advice was accepted, and a doctrine appropriate to the deterrence of unlimited aggression was inappropriately extended into the field of limited aggression. It is, of course, easy to be wise after the event, when the policy has been criticized to the point almost of ridicule on both sides of the Atlantic, when it has failed in practice (Indo-China), and when it has been tacitly abandoned. It is, however, perhaps legitimate to hope that, on balance, the writings of Professor Brodie and others who have made it their profession, in the words of Sir John Slessor, "to think deeply and constructively about the 'massive' problems of modern strategy" will make the occurrence of a similar mistake less likely in the future.

This then is the background—or at least one interpretation of the background—against which the broad conclusions of Professor Brodie's book should be examined. These conclusions may be taken as broadly representative of informed American opinion today, and it is of interest to see where, and in what particular way, they differ from current British thought. Those of Professor Brodie's conclusions which refer to strategic deterrence may, it is suggested, fairly be presented as follows:—

(*a*) The chances of all-out war occurring are "finite and perhaps even substantial, the more so as we ignore them."

(*b*) "The people of the United States have obviously made a decision, with little overt debate but quite remarkable unanimity, against any form of preventive war."

(*c*) This decision means that, in the event of total war, the United States cannot count on getting in the first blow.

(*d*) This, in turn, means that the United States "*must* devote much of its military energies to cutting down drastically the advantage that the enemy can derive from hitting first by surprise attack. This entails doing a number of things, but it means above all guaranteeing through various forms of protection the survival of the retaliatory force under attack."

(*e*) That 'hardening' is an essential form of protection for at least part of the retaliatory force.

(*f*) "... At the very least protection of population must be seriously provided for, and that such protection can be reasonably justified on political and strategic as well as on humanitarian grounds."

It is thought that few people in this country would disagree with the statement that the chances of all-out war occurring are finite, if the word was used in the sense of ' very small.' Professor Brodie, however, uses it in the sense of ' greater than zero.' Whilst no one can dispute the accuracy of his position, the difference in meaning is significant and is, in itself, a typical illustration of the difference in attitude and emphasis which exists in strategic thought in the two countries. The conclusion as a whole tends to lose its scientific detachment, however, when the words ". . . and perhaps even substantial . . ." are added. This is an expression of opinion which robs ' finite ' of its minimal connotation, and leaves the impression that all-out war is quite likely. Whilst this may well be so, this conclusion rests on foundations of which at least one is debatable. These are, briefly, three in number: that deterrence is not automatic and will be hard to achieve; that the one indispensable ingredient for the successful destruction of the Western retaliatory air capability is surprise; and, thirdly, that should the Russians feel confident of achieving this surprise, deliberate attack on their part would be logical. It is clearly inferred that this degree of surprise might be possible to achieve, and that a deliberate all-out attack is therefore not unlikely.

Granted the correctness of the first two arguments—and even the logicality of the third—the likelihood of deliberate attack does not seem to follow. The proposition that the Soviets could count on achieving complete surprise seems very doubtful, particularly in the light of the U.2 incident, which has shown America's determination not to be taken off guard. Sir John Slessor has no doubts on this score. He writes: " I don't say that if they [the rulers of Russia] could be absolutely sure that they could completely destroy all Western retaliatory power in a single surprise attack that they would necessarily be restrained by ethical or humanitarian considerations . . . but, of course, they cannot possibly be certain . . . they . . . would have to calculate that even a very great success against our air and missile forces in a surprise attack might still result in them losing a number of their largest cities."

It will be noticed that Sir John, whilst dismissing the possibility of completely successful surprise attack, goes a long way towards accepting the view that Russia would launch such an attack if it lay within her power to do so. This idea is, of course, at the root of American thinking. In the American view, should the deterrent become ineffective, Russian strategic attack would follow inevitably and immediately. Whilst, admittedly, one would not like to take a chance on it, this is a creed which I believe the average Englishman would find hard to accept. I have been unable to find any precise disclaimers of it in military writing, so perhaps I am wrong, but the theory seems altogether too black and white, too logical, and above all too horrific to ring true. Should Russia ever be in that position, and be convinced of the Western renunciation of preventive war, the way would be open for nuclear blackmail and the employment of her conventional forces—courses of action which, at least in the first instance, might have more to recommend them than the partial devastation of the Western world.

It is, in the same vein, perhaps worth remarking on the purpose of the Russian I.C.B.M. build-up. It would seem to be tacitly accepted that this would be the prime weapon of surprise attack. But is the accuracy of the I.C.B.M. great enough to make it an appropriate weapon to use against a pin-point target such as a Minuteman silo? And, with the introduction of a Ballistic Missile Early Warning System, would I.C.B.M.s be effective against aircraft on ground alert? If, as one is tempted to believe, the answer to both questions is ' no' then the I.C.B.M. must predominantly

be a ' strike second ' or retaliatory weapon system. With the national renunciation of preventive war, American I.C.B.M.s clearly fall within this category; is there any solid reason to assume that the Russians view their own system in any different light ?

Whilst these overtones of doubt are personal, they do not seem incompatible with a discernible national tendency towards disbelief in intercontinental nuclear war. This is perhaps the main difference; to an American the threat of deliberate nuclear war is both real and urgent whilst to most Englishmen it is neither. On the surface, and intellectually, the threat is accepted, but deep down and instinctively its reality is denied.

Professor Brodie's second conclusion—that the United States has obviously decided against any form of preventive war—is remarkable only in that it was considered worth voicing in 1960. Writing in 1956[8], William Kaufmann (who acknowledged a special debt to Professor Brodie) left little doubt that, in his view, preventive war was no longer in the running as a possible course of action. In discussing limited war, he wrote: "... By rejecting the alternative of preventive war, by refusing to employ force to change existing territorial dispensations, we have conceded to the enemy the advantage of striking the first blow ever since 1945. ..." and again, in a different chapter: "... It was in fact inevitable, once we had decided not to launch an atomic attack against the basic structure of Russian power during the period of our monopoly, that the increasing diversification of Communist military means would ultimately deprive us of the will to strike this kind of blow. ..." Professor Blackett, writing[9] in the same year as Kaufmann, named 1954 as the year in which the possibility of a policy based on the threat of preventive war was everywhere recognized as dead. In his view, because of an inadequate stockpile, a quick and cheap preventive war was not militarily possible during 1945 to 1949, the period of atomic monopoly. Even during the period 1949 to 1953, which he terms the years of quantitative superiority, Professor Blackett does not think the chances of preventive war ever rated very high: "... During the period ... both the incentive for and the feasibility of preventive war reached their height. ... However ... on the whole, Western military opinion was inevitably very firmly against preventive war. Moreover, the moral arguments against preventive war were repeatedly and cogently argued in the West. ..."

This assessment would seem to accord with the views being expressed by other responsible writers during the periods in question. For example, in a book[10] edited by Professor Brodie and published in 1946, we find the following: " If the monopoly cannot and should not be made to serve as an instrument of diplomatic pressure, must the idea of actually using the bomb while we alone possess it also be ruled out under all circumstances? ... To the credit of the American people it can be said that where the question has been raised at all the attention has centred on ways and means by which atomic bombing or the threat of such bombing could be made to serve the interests of mankind and of the peace of the world. ... However, the idea of a preventive war is so abhorrent to American feeling that no government in this country, to judge from the state of public opinion today, could hope to gain popular support for such an adventure. ..."

As an example of the views obtaining during the period of quantitative superiority, we have the following, written[11] in 1949: " The real point is whether we

[8] *Military Policy and National Security.*
[9] *Atomic Weapons and East-West Relations.*
[10] *The Absolute Weapon.*
[11] *Modern Arms and Free Men,* Vannevar Bush.

would then force a war ourselves, striking while the advantage lay with us. . . . A government truly responsive to the will of a genuinely free people would not. Certain it is, if we did thus embark on a prophylactic war, we should lose the very freedoms we cherish and for which we would be fighting. For freedom would have to be suppressed in some manner to cause us to embark on armed conquest of any comprehensive nature, and this would be armed conquest of the worst sort."

Professor Brodie's third main conclusion, that this renunciation of preventive war means that in the event of total war the United States cannot count on getting in the first blow, would seem, if anything, to be an understatement. If, as would seem correct, the definition of preventive war is wide enough to include a ' pre-emptive strike ' or ' forestalling blow,' the chances of the West being first on target are virtually zero. Furthermore, this tacit surrender of the military initiative accords with expressed views (so numerous as to qualify for the term ' general ') that the Western governments, with traditional reluctance to strike the first blow, would not order a strategic attack until enemy weapons had actually been delivered.

If this is accepted it follows automatically, as Professor Brodie has pointed out, that the United States (and Great Britain) must guarantee, through various forms of protection, the survival of the retaliatory force under attack. About this there can be no question; it is the means of ensuring this survival which is open to argument and, specifically, whether a policy of hardening should be adopted. Presumably it would be reasonable to hope that Minuteman, when it comes into service, will enjoy a period of virtual immunity from destruction in its deep underground silos. How long this period will last one has no means of knowing, but the history of Blue Streak may be an indication that this immunity will not be unduly prolonged. Similarly, in the normal nature of technological advance, the relative invulnerability of the Polaris submarine may well prove to be short-lived. The aircraft carrier, in the specific context of a retaliatory strike platform in global war, is already obsolete. Thus, when Professor Brodie advocates a policy of hardening, he is thinking primarily of aircraft. About the Strategic Air Command, he has this to say: " In general, the strategic air arm must resort to some combination of dispersion, hardening of facilities, and provision of alert and airborne contingents. Just what the combination of measures should be has been the subject of intensive research. . . . If aircraft are worth maintaining at all—and the informed consensus is that they will be for a long time to come—they are worth putting in strong shelters. Such shelters could make it necessary for the enemy to send aircraft rather than missiles for the destruction of our bombers, because the former have the greater accuracy and the larger weapon charges. . . . The only comparable alternative is ' airborne alert,' . . . but this system is too limited in effectiveness to be sufficient in itself, and probably very expensive per unit thus protected."

Professor Brodie considers that, as the main emphasis of Russian strategic armament shifts from aircraft to missiles, the relative value of hardening will be greatly increased. He feels, however, that " any comprehensive system for protection would have to depend on a combination of several schemes or devices, though the least dispensable single one of these appears to be hardening." He concludes that this ". . . will hold true until missiles become so accurate that a high percentage of direct hits (i.e. target falling within the cratering circle or fireball) become feasible at intercontinental ranges. When that time comes, and some think it may not be many years off, protection for the retaliatory forces will very likely have to be sought in mobility, that is, in their being more or less continually moved about, whether on land, at sea, or in the air."

Sir John Slessor appears at first sight to go along with this view. He writes: ". . . Mr. Brodie is surely right in claiming that measures like hardening are things we can and must afford. Airborne alert is grossly uneconomical . . . a . . . standard of readiness like that in Fighter Command during the Battle of Britain as a permanent condition for the retaliatory striking forces simply is not a practical proposition." But then comes the big difference. " But I have never believed, and still do not, in the completely unheralded ' bolt from the blue,' the sudden deluge of bombs or missiles out of a clear international sky. And I think Mr. Brodie underestimates the ease with which, in periods of tension, even heavy bombers can be ' scrambled ' at very short notice indeed."

These extracts seem to me to point a clear (and basic) difference in national view. Sir John does not accept the possibility of surprise attack, and believes firmly in a period of international tension and strategic warning during which steps could be taken to ensure that the bomber force escaped destruction. Professor Brodie, on the other hand, sees surprise attack as the most advantageous, and therefore the most likely, concept for the enemy to adopt. Whichever view may be right, it is clearly wise to take those measures which are likely to prove most effective in safeguarding the retaliatory force. But is hardening one of these ? Even on Professor Brodie's reckoning, its period of effective life would be limited to a few years at most, after which protection " will very likely have to be sought in mobility." Why not go straight for the mobility and save many millions of dollars ?

Professor Brodie's final conclusion concerns the vexed question of civil defence and, in his view, the policy of hardening should be extended to the civil population— " at the very least protection of population must be seriously provided for. . . ." He makes his point less, perhaps, on humanitarian grounds than on the need for increased freedom of governmental action, and for an increase in the credibility of the deterrent which a shelter policy would give. This is an argument which has often been advanced, and which was put particularly clearly by Professor Klaus Knorr, writing[12] in 1956: " Defensive preparations would demonstrate to any would-be aggressor that the United States is neither given to delusion nor bluffing, but that it means business. Passive defence increases the credibility of our willingness to deter nuclear war. If these expectations are correct, then a strengthening of defence might, by discouraging attack, increase the likelihood that we shall be spared disaster."

The logic of this argument cannot be refuted, but could there not be another side to the coin ? Might it not be that a shelter programme could be interpreted not as a sign of determination to fight as a last resort, but as an indication that preparations for attack were under way ? One is tempted to think that responsible officials in the West would, to say the least of it, be uneasy if they were to hear that Russia was embarking on a large-scale programme of passive defence. One thing is, however, quite clear. For whatever reason, the logic of the argument in favour of passive defence has had little appeal for the governments of the West. Possibly they adhere to Lewis Carroll's view: " ' Contrariwise,' continued Tweedledee, ' if it was so, it might be; and if it were so, it would be: but as it isn't, it ain't. That's logic.' "

[12] *Military Policy and National Security*, Edited by William W. Kaufmann.

THE VALUE OF AMPHIBIOUS FLEXIBILITY AND FORCES

By Captain B. H. Liddell Hart

THE Pacific campaign in the second World War has long been recognized as a superb demonstration of the strategic value of amphibious flexibility. It is very clear that without the distracting and the by-passing power it conferred —the ability to vary the thrust-point while keeping the opponent on the stretch— the penetration of Japan's successive outlying defence lines would have been a far slower and more costly process.

In contrast, the war in Europe is regarded as mainly a continental land struggle, determined by the direct action of the armies and air forces, in which sea power merely played a subsidiary role as the means of conveying troops and supplies to feed the fight. Moreover, in the familiar picture of the war, such part as sea power played appears to be of relatively little importance as an influence on the Eastern Front— the only fighting front in Europe until late in 1943, and the one where the largest part of the German Army continued to be engaged until the end of the war.

But analysis of the distribution of Germany's strength at successive stages of the war leads to very different conclusions and changes the picture. From such analysis it becomes evident that the amphibious flexibility provided by sea power, which the Western allies possessed, exerted a much greater influence than appears on the surface of events.

In May, 1940, the Germans massed 65 per cent. of their strength in the armies deployed to invade France and the Low Countries, leaving only 5 per cent. to guard their rear against the Russian armies that had advanced into and occupied the eastern half of Poland. That immensely disproportionate distribution was not due to unreserved trust in the Russians' peaceful intentions but to the temporary insurance provided by their own large strategic reserve (OKH Reserve) amounting to 30 per cent. of their total strength in divisions. For, although it was handily placed to back up the offensive in the West, part of it could have been quickly switched eastward to Poland if the Russians had made any threatening move on that front. The distance between the two fronts was not large. Moreover, when it became quite clear that no Russian move in Poland was developing, the Germans were emboldened to use the whole of this reserve to support their advance into the West, so that 95 per cent. of their strength was eventually committed there.

A very significant difference was seen in the Germans' deployment, and proportionate concentration, for the invasion of Russia in 1941. Here, only 60 per cent. (120 divisions) of their strength was launched in the offensive, and only 13 per cent. (26 divisions) was in strategic reserve to reinforce the attacking armies. For 27 per cent. of the German strength (53 divisions) was standing guard in the sea-girdled and sea-menaced areas of western, north-western and south-eastern Europe—an 8,000 miles stretch of coastline.

That large subtraction from the concentration against Russia was of great detriment to Germany's chances of victory and of great help to Russia's chances of withstanding attack. It became of increasingly vital importance once Russia succeeded in surviving the first onslaught.

Such a conclusion is not a claim for the *actual* effect of what Britain, the only survivor of the original Western alliance, did to draw German strength away from the

Russian front. Her efforts were small, and their effect slighter than has been claimed by Churchill, Alanbrooke, and other British military chiefs or their spokesmen. These overclaims have obscured, or at least blurred, the basic fact and the basic lesson. For the vital subtraction was really due to the widespread threat, and consequent distraction, inherent in sea power and its essential complement, amphibious flexibility of striking power against any sea-coast stretches. It was the potential threat that had the actual effect.

Further significant points, and lessons, emerge in closer examination of the 1941 situation, at the time that the Germans embarked on the invasion of Russia. In the first place the detailed distribution of the subtracted strength is worth study and emphasis.

In France and the Low Countries were stationed 38 divisions, or 19 per cent. of the Germans' total field army. In Norway and Denmark there were eight divisions, a further 4 per cent. of the total. In neither of these areas was the subtraction due to any imminent counter-invasion that the British looked likely to make, or were capable of making in the period of gradual recuperation from the 1940 disaster in France, when they had lost most of their equipment although they had managed to extricate most of their troops. But the largeness of the subtraction to guard these areas cannot, alternatively, be ascribed simply to the fact that they consisted of countries recently conquered and occupied by the Germans which had to be held down. For at this time the resistance movements in these countries were causing no serious trouble, and were not as formidable as in Poland, where the Germans had nevertheless dared to reduce their forces much more, when striking westward in 1940, in spite of having simultaneously to hold down the Poles and keep on guard against the Russians.

Thus it is difficult to see any factor that can be credited with major effect on the subtraction except the mental impression, on Continental minds, of the inherent threat and instinctive stretch produced by sea power *plus* amphibious flexibility. That inference is reinforced by the fact that of the eight divisions posted in the Scandinavian area, only one was in Denmark while seven were in Norway, which presented a far longer and more exposed coastline to seaborne countermoves. It is the *potential* effectiveness of the threat, and disturbance, that best explains the seven-fold difference in the protective strength allocated by the Germans to Norway as compared with Denmark, where a British landing would have been a closer menace to Germany itself but was much more difficult to gain and maintain, as the Germans realized.

In the Mediterranean theatre, the Germans left nine divisions at the time they invaded Russia. Seven of these were in the Balkans, which Hitler had been impelled to invade before tackling Russia by his fear of a British seaborne threat to the flank of his advance into Russia and to the Rumanian oilfields on which his forces depended for fuel. Although he had expelled the British from Greece he continued to fear a renewal of the threat, and his Balkan detachment would have been larger still but for the fact that his Italian allies took a big share in garrisoning that area.

The other two German divisions in the Mediterranean theatre formed the panzer group that had recently been despatched overseas, under Rommel's command, to support the Italian army in North Africa after its shattering defeat by the British. That small detachment proved a profitable strategic investment, in contrast to the much larger ones elsewhere, for it not only saved the Italians from complete collapse and preserved the Axis position in North Africa for a further two years but also

developed a threat to the British hold on Egypt and the Suez Canal which drew thither more than 20 divisions from Britain's reserves—nearly half her operational strength. It was by far the most effective distraction that Germany produced in the war, and one of the most striking examples in history of what can be achieved in that way by an oversea expedition. Even so, it was far from equalling the overall balance of distraction produced, to the Germans' disadvantage, merely by the threat of amphibious flexibility—that ' potential ' which had been Britain's greatest asset in all her wars and which was now greatly augmented by American reinforcement.

Sea power made possible the combined American and British landings on the coast of French North Africa, in November, 1942, and then trapped the German and Italian forces in Tunisia, ensuring that the whole of them were ' put in the bag ' in May, 1943. That result cleared the way for the Allied re-entry into Europe by eliminating the bulk of the forces which would otherwise have faced them in Sicily and might easily have blocked their capture of that stepping stone. The successful landing in Sicily, two months later, produced the downfall of Mussolini and the quickly following surrender of Italy.

The Allied follow-up on the mainland of Italy, and her break-away from alliance with Germany, immediately drew 18 German divisions into Italy in an effort to check the Allies' invasion—made with 15 divisions—while the German forces in the Balkans were also doubled, being brought up to 15 divisions there as a protective measure. That was a good balance of distraction in the Allies' favour.

But in Italy itself the balance tilted the opposite way when the Allied armies suffered repeated and prolonged checks in their effort to advance up the narrow peninsula. To revive the advance in 1944, the Allies poured 30 divisions into Italy against the Germans' 22, divisions which were on the average barely two-thirds the strength of Allied divisions. Although that swelling reinforcement now, at last, succeeded in levering the Germans out of Rome and driving them back to the Gothic Line in the mountain belt north of Florence where they held on until the following year, the invasion of Italy had ceased to pay a good strategic dividend in proportion to the resources invested in it.

Nevertheless the amphibious power of the Allies had in other respects achieved an increasing strategic effect on the situation as a whole, to Germany's detriment and Russia's benefit. For at the beginning of June, 1944, before any other Allied landing had taken place, only 55 per cent. (165 divisions) of the German Army[1] remained on the Eastern front to meet the increasing pressure of the Russians' tidal advance, while nearly 45 per cent. (133 divisions) had been drawn westward or southward to guard against the threat of Anglo-American seaborne invasion.

It is also very significant that, of the total, barely 10 per cent. (32 divisions) was posted in the northern part of France (north of the Loire) to meet the impending cross-channel attack. Moreover only 6 per cent. (18 divisions) was employed with the two armies that held the front in central Italy against the Allied offensive there.

In contrast, 18 divisions were posted in Norway and Denmark; 9 in the Low Countries; 8 in the south-west of France covering the Biscay coast; 10 in the south-east of France covering the Mediterranean coast; 10 covering the Mediterranean and Adriatic coasts of northern Italy; and a further 28 in the south-east of Europe, another area which presented a long coastline to potential seaborne

[1] The total number of divisions had been increased from 200 in 1941 to approximately 300 by 1944, but divisional strengths were reduced.

invasion. This total of 83 divisions was a subtraction of German strength produced mainly by the looming shadow of possible seaborne attack by the Western allies, for partisan activity was formidable only in Yugoslavia. Such a vast distraction, nearly 30 per cent. of Germany's total resources, was tremendous testimony to the effect of amphibious flexibility.

It is worth note, however, that when the Allies actually landed, their distraction effect did not increase proportionately to the effort made, and in some cases began to diminish soon after the landing. That diminishing return was most marked in the Italian campaign where, after the opening phase, the Allies were employing a much larger force than that opposing their advance. The unfavourable turn was due partly to the narrowness of the Italian peninsula. The basic lesson is that *offensive* distraction is most effective *when* it carries a wide strategic threat and *where* there is ample room for its development by attack to be expanded easily and quickly into a widening tactical threat.

But the comparatively poor distraction effect of the Italian campaign, after the landing, was also due to diminishing amphibious power in the Mediterranean theatre. Italy would have been more a suitable site for attack if there had been ample assault shipping and for a long enough time. But when the decision was made to land there, the planners had already committed themselves to an undertaking that most of the assault shipping which was available should be moved back to harbours in Britain in readiness for the cross-Channel attack. The key importance of adequate amphibious means is another basic lesson of modern warfare.

'Adequate amphibious means' are not only a matter of ships. Skilled personnel are of no less importance, and they need to be available in adequate numbers if landing operations are to be executed smoothly and exploited quickly. The required skill is the fruit of long training in amphibious techniques and of constant practice in combination of the various elements in such a force.

In studying the African, Sicilian, Salerno, and Anzio landings it becomes evident that many hitches and delays occurred from lack of knowledge and experience in dealing with amphibious problems, and from differences of view between the Army and the Navy commanders and staffs, respectively. At Salerno, the first time when tough opposition was met, a costly check was suffered and a crisis developed, so grave that General Mark Clark described it, even in cool retrospect, as "a near disaster." Only by a narrow margin did the landing force hold off the German counter-attack and avoid being driven back into the sea. Yet the counter-attack did not come until five days after the landing, and was even then delivered by a force much smaller than the Allies had by then placed ashore. At Anzio, four months later, a great opportunity was lost of unhinging the German front by this landing in its rear, near Rome, and then another crisis developed. Yet the Germans were so weak in the area, and so strained in general, that 13 days passed before the counter-attack was delivered. Such lengthy time lapses offered the Allies ample opportunity to establish and exploit their lodgment, and their failure to profit from the long respite emphasizes the inefficiency of these landings operations in execution as contrasted with conception.

In searching for the explanation, and in comparing the execution with the better performances among Pacific landing operations, a clue can be found in a significant factor there, which was missing in the Mediterranean, and in the European theatre as a whole. For in this theatre there was no specialized amphibious force

such as the U.S. Marine Corps divisions provided in the Pacific. A spearhead of such divisions might well have made a striking difference to the rapidity and effectiveness of the landing operations in the European theatre.

That deduction is strengthened in the course of studying British landing operations—not only those in the second World War, but throughout the past 300 years. During these centuries, Britain has by force of circumstances, particularly her geographical situation, been the most distinctively amphibious of all the Powers. Until very recently her Navy was supreme among the fleets of the world, and by it she maintained a world-wide empire in spite of the smallness of her island home base. Yet for all her success at sea, and in expanding overseas, her performance in amphibious warfare did not match her experience of it. Her expeditionary forces more often failed than succeeded in gaining their objectives when they met any serious opposition.

During the hundred years prior to the French Revolution, Britain was repeatedly at war with France, which under the Bourbons was not only threatening to dominate the continent of Europe but also the world overseas. In these struggles Britain relied on sea power to counterbalance French land power and exploited her advantage at sea to achieve compensating gains that could provide bargaining counters in peace negotiations. An examination of the record shows, however, that out of 17 amphibious expeditions which Britain launched during these hundred years against France and her colonies, only seven attained their objectives. In the 20 years' struggle against Revolutionary and Napoleonic France that followed, only four out of 12 were successful. The most common cause of failure was mutual misunderstanding of the other Service's problems, between the general in charge of the expeditionary force and the admiral in charge of the escorting fleet, and between their respective subordinates. All too often the attack miscarried or evaporated in wrangling between the co-operating Services who, through incompatibility of views and loyalties, were apt to become the enemy's best allies.

The record of British amphibious operations was even more disappointing in the next great war a century later. At this time the leaders of the British Army had become so continentally-minded that their governing idea was simply to provide a direct reinforcement to France—the traditional enemy who had now become Britain's ally—by shipping the bulk of the Army across the Channel to fight alongside the French Army. They frowned on the arguments voiced by Winston Churchill, Admiral 'Jacky' Fisher, and Maurice Hankey (the Marine officer who became Secretary of the Committee of Imperial Defence and the War Cabinet) for continuing to follow the historic principles of British strategy, a strategic tradition which had now in the eyes of the soldiers become a heresy. Thus few amphibious operations were attempted compared with the number of earlier wars, and they did not fulfil expectations owing largely to the continuance of mutual misunderstanding and difference of view between the Services.

The attempt, in October, 1914, to save Antwerp from the Germans became a disjointed fiasco. Early in November a seaborne expeditionary force, sent to capture German East Africa, landed at Tanga but was driven to re-embark three days later. After that repulse it was decided to substitute an overland advance, but this took four years to achieve its purpose. Germany's other colonies in Africa were also conquered by overland expeditions, of varying duration, and only her undefended Pacific islands were captured by seaborne moves.

In 1915 the one important amphibious operation of the war was launched, to open the Dardanelles by capturing the Gallipoli peninsula, which commands the gateway to these straits, and knock out Germany's Turkish ally. Amphibious flexibility and its distracting effect helped the British to take the Turks off balance both in the original April landing and again in the fresh August landing farther up the peninsula. But on each occasion opportunity was forfeited on landing and a costly stalemate ensued. At the end of the year the expeditionary force was evacuated.

Even though it failed, the Gallipoli expedition had by its threat upset the whole war plan of the Germans for 1915. What success would have meant to the Triple Entente (Britain, France, and Russia) is shown by the testimony of General von Falkenhayn, then the directing head of the Germanic alliance: " If the straits between the Mediterranean and the Black Sea were not permanently closed to Entente traffic, all [our] hopes of a successful issue of the war would be seriously diminished. Russia would have been freed from her strategic isolation which . . . offered a surer guarantee than any military success . . . that the forces of this Titan would eventually and automatically be crippled." That eventual crippling, by 1917, resulted from the way that, in 1915, a far-sighted amphibious conception was wrecked by a chain of errors in execution. The consequences were far-reaching, for the crippling of Russia's forces led to the Revolution there and the establishment of the Communist regime.

More immediately, the dismal ending of the Gallipoli expedition caused the British to abandon the idea of renewing their amphibious strategy and committed them more fully to the grinding and long-drawn attrition campaign on the deeply entrenched Western Front that left both Britain and France exhausted by the time that the war was ended. The only bright amphibious flash in these years was the raid on the Germans' advanced naval base at Zeebrugge in 1918 on St. George's Day, which was carried out purely by the Navy with assault companies of Marines.

Between then and the second World War, the introduction of some measures of joint staff training raised hopes that amphibious operations would be better conducted if war came again. But in 1940 the seaborne moves to counter the German invasion of Norway were as badly bungled as almost any of those in the past. The next important amphibious thrust, that against Dieppe in 1942, was also a depressing fiasco. Subsequent amphibious operations, carried out in conjunction with American forces, have already been examined and discussed.

It is strange, and puzzling, that Britain's performance in amphibious operations during the course of these three centuries should have been so poor in comparison with the achievement of her Navy on the seas, and also of her Army in many of the battles it fought on foreign soil when operating on its own and out of reach of naval support. The clue to the puzzle can be found in a missing factor, and instrument. For although Britain formed a force of marines as far back as 1664—originally named the ' Admiral's regiment '—and although its great value was soon proved, it has always been confined to a very limited scale and scope. It has never been developed, like the U.S. Marine Corps, into a strong amphibious fighting force embodying all the different arms and elements required for effective attacking power, and capable of carrying out a large-scale landing operation. An explanation of Britain's oft-repeated failure in such operations can be seen in her neglect to develop the Royal Marines in this way and for this purpose. Moreover, no other explanation becomes apparent in studying the record.

The official neglect, or reluctance, to develop them is the more strange because their value was so amply acknowledged by famous expeditionary commanders.

Indeed, Admiral Vernon was so impressed that in 1739 he urged " the necessity of converting most of our marching regiments into marines." In 1802 they were made a Royal corps on the recommendation of that great commander and strategist, Lord St. Vincent, who declared: " There never was an appeal made to them for honour, courage, or loyalty, that they did not more than realize my highest expectations. If ever real danger should come to England, the marines will be found the country's sheet-anchor." In default of their expansion on an adequate scale, he urged that England's next best policy, as an amphibious power, would be to make every infantry regiment serve afloat as marines, in rotation, as part of their duty. In 1804, on Nelson's recommendation, a corps of artillery was added to the Royal Marines for duty both in ships and ashore. Their performance in the shore role was so good that Napier, the soldier historian of the Peninsular War, frankly acknowledged that; " Never in my life have I seen soldiers like the Royal Marine Artillery." But 16 years after the war, when its lessons were fading, the Royal Marine Artillery was abolished as a measure of economy, although subsequently revived after further reflection on experience.

Why is it that in Britain, the country most dependent on sea power, the marines have never been developed in adequate scale and scope as they have been in America ? The basic hindrance has been that opposing vested interests, which are strong everywhere, are reinforced by the distrust of specialization, which is a British characteristic. The Services, and particularly the Army, have always been inclined to resist specialist claims and specialized forces.

If compelled by necessity to accept these, the Army has sought to discard them as soon as possible, and usually too soon. It maintains its faith in the ' general purpose ' concept, the idea and ideal that *every* man should be capable of fitting *any* job, and be a ' jack of all trades '. Linked with such disregard of differing aptitudes has been an ingrained distrust of those who mastered any special technique, often prompted by an underlying fear that recognition of its importance would disqualify for promotion those who had not acquired it. This very common attitude is reinforced by the repugnance which armies have constantly shown towards new methods and new instruments. Even when something new could no longer be resisted, its further development has too often been handed over to a general ' handyman ' who would not be likely to make the most of its potentialities.

The most significant development of the 19th century was the introduction of light infantry, nimble sharpshooters who skirmished ahead of the line, using cover and individual aimed fire, to harass the close-packed ranks of the enemy's line or massive columns and thus pave the way for the advance of their own. A light company was added to each battalion. Then, profiting from bitter experience in the American backwoods, some of the more progressive British officers secured the formation of regiments composed entirely of light infantry. Nursed by Sir John Moore, they were formed into an *elite* force, the famous Light Division of the Peninsular War, which surpassed all other infantry in its combined exploitation of mobility and firepower. But during the long peace that followed the force was broken up and the regiments were brought back into conformity of role and tactics with the ordinary infantry, retaining only their distinctive title, tradition, a more flexible system of drill, and a faster pace.

Towards the end of the 19th century the invention of the machine-gun foreshadowed another radical change in tactics, but when it was at last adopted in the British Army it was parcelled out among the infantry at the rate of two to a battalion.

These little special packets did not fit into the battalion pattern, and on exercises the only orders that the machine-gun officer was apt to get were: "Take the damned things away and hide 'em." They were not effectively used until a Machine Gun Corps was formed late in 1915 after more than a year of war. And when the war ended the Corps was disbanded.

The most revolutionary invention in that war was the tank. But the personnel of this new arm were at first organized only as a branch of the Machine Gun Corps, and even when a Tank Corps was created in 1917 as a recognition of what it had achieved, it was maintained on a temporary basis for a further six years. Only in 1923 did the Army Council, after much hesitation, agree to it being made permanent as the Royal Tank Corps. But it was kept on a very small scale. Sixteen years later, on the eve of the second World War, it was merged with the cavalry, who were belatedly converted from horses and much more numerous, in a common frame entitled the Royal Armoured Corps. The resulting scarcity and dilution of expert knowledge and experience in Britain's Armoured Corps goes far to explain why, in spite of its pioneer achievements, its performance as a whole in the second World War compared poorly with the German which, although not formed until 1933, was treated as an *elite* force from that time on.

From Gideon to Guderian, the value of *elite* forces has been repeatedly demonstrated in warfare. The '300' that formed "The *sword* of the Lord, and of Gideon" in defeating the host of Midian were picked, out of 10,000, by the way they gave evidence of exceptional dash. The 'Royal Companions' (cavalry) and 'Royal Hypaspists' (foot) played a decisive part in Alexander the Great's unbroken run of victories. So did the Guards division in Genghiz Khan's. Cromwell's 'Ironsides' of the 'New Model', Napoleon's Imperial Guard, Ludendorff's 'storm troops' in the German break-through attacks of 1918, and 'Guderian's Panzers' in 1940 are among the other successive links in the historical chain of evidence that proves the value of having *elite* forces for tasks of key importance.

The British however have long shown an obstinate disfavour for the concept, except in its application to the social sphere. Although the Foot Guards have a very fine military record, they would hardly have survived but for their intimate association with the monarchy. In war, the British have paid heavily for their reluctance to recognize the need and value of special skills, and in no respect have they paid so heavily as in amphibious operations.

The Americans have adjusted their forces far better to changing conditions and new needs, especially in the amphibious sphere. The development of the Marine Corps as a spearhead force in this sphere, embodying all the various elements required for timely effect, has been a striking example. It is a model of how special problems should be tackled by special means.

It was through sea power and its 'companion'—the power to carry by sea a force that can be thrown ashore wherever desired or needed—that for centuries Britain helped her friends on the Continent to resist aggression, and averted its domination by any single nation or tyrant. The same coupled power also enabled this small island country of very limited strength to maintain a world-wide network of colonies and protectorates. In the second World War this coupled power, immensely reinforced when the United States came into the war alongside Britain, was basically the decisive factor in liberating Europe from Hitler's tyranny, as well as in liberating the Far East from Japan's. For air power then had not the range to exert its effect until

bases were gained within close enough reach of the enemy for it to operate effectively, while Russia's land power was not enough by itself to overthrow him.

After the war the older kinds of military power were for a time overshadowed—and in the public's eye eclipsed—by the development of nuclear power conveyed by air. But nuclear power was too drastic and dangerous for use except as a last resort, even while it remained a monopoly, and thus in many respects unsuitable as a counter to insidious or limited forms of aggression. So sea power and its amphibious companion continued to be the operative means for curbing aggression against any of the free countries on the Eurasian land mass. Their prospects of protection have depended more on being within supporting reach from the sea than on the shadowy, and boomerang, threat of a nuclear retort.

Now that Russia has produced nuclear weapons in large quantity to match America's, and taken the lead with inter-Continental missiles, a nuclear stalemate has developed. In these circumstances, local and limited aggression becomes more likely, while amphibious forces become more necessary, both as a deterrent and as a counter to it, a counter which can be used without being suicidal and a deterrent which is therefore credible.

On a superficial view, airborne forces may appear to be a better counter, as being quicker to arrive. But their speed of strategic movement, and effect on arrival, are subject to many limitations.

Many of the spots where an emergency may arise are far distant, and cannot be reached by air without flying over foreign territory or making a long circuit to avoid it. Most of the Asiatic and African countries are acutely sensitive to any infringement of their recently acquired independence, resentful of Western interference in those regions, and insistent on preserving neutrality, or apt to side with the opponents of the West. A circuitous air approach, even where possible, increases the need for intermediate bases, where aircraft can be refuelled and serviced, while their establishment and maintenance are subject to similar political difficulties.

Strategic movement by air is so liable to be blocked or impeded by countries in its path so that it is becoming strategically unreliable as a way of meeting the world-wide problems of the Atlantic Alliance, which, more truly, should be called the Oceanic Alliance.

Moreover, on arrival, an airborne force needs airfields for its disembarkation and logistic support. Adequate ones for large aircraft and a large force do not exist in many areas, and even when they do they may be in hostile hands. If well defended, an attempt to capture them by parachute drop can easily turn into disaster, while a ground approach may be checked through lack of tactical mobility and of weapon-power sufficient to overcome strong resistance. For an airborne force is narrowly limited in the vehicles, heavy weapons, and ammunition it can carry. If it is held up and has to wait for these requirements to arrive by sea, it loses its main advantage—rapidity of intervention. Another of its drawbacks is its vulnerability to interception while in transit. On top of all comes the high cost of strategic air movement; for one division 20 times what it costs by sea for a medium-range move of about 2,000 miles, and 40 times for long-range moves of about 8,000 miles.

In tackling emergencies, two hands are better than one—and essential when one is unreliable. While it is desirable to have an airborne force, which enables quicker intervention where its use is possible, it is essential to have a marine force, and better that this should be the bigger of the two. For the bigger it is the more possible becomes

a strategic deployment wide enough and strong enough to ensure early and effective intervention wherever there is a blaze, and before it spreads. An amphibious force of modern type, operating from the sea and equipped with helicopters, is free from dependence on airfields, beaches, ports, land-bases, with all their logistical and political complications. The use of an airborne force, or of any land-based force, is a more irrevocable step, since its commitment is more definite and its withdrawal more difficult. A self-contained and sea-based amphibious force, of which the U.S. Marine Corps is the prototype, is the best kind of fire-extinguisher because of its flexibility, reliability, logistic simplicity, and relative economy.

Finally, it may be useful to summarise the principal conclusions that emerge from an extensive study of war history, past and contemporary, and in particular of the part that sea-based Powers have played.

(*a*) Amphibious flexibility is the greatest strategic asset that a sea-based Power possesses. It creates a distraction to a continental enemy's concentration that is most advantageously disproportionate to the resources employed.

(*b*) The distracting effect is apt to diminish, however, after a landing takes place unless this is made in an area spacious enough for its expansion into a widening threat, and unless its exploitation is rapid, particularly in the opening phase.

(*c*) The best way to ensure such initial rapidity lies in the use of a specialized amphibious force, and the need for it is now greater than ever before. Although Britain has, by force of geographical circumstances, been more amphibious in action than any other Power, her performance has been much poorer than her experience. That deficiency is due to her failure to develop her marines into a special ' lock-opening ' force of adequate scale. The United States has been wiser in this important respect.

(*d*) The value of such a force is endorsed by the sum of experience through the ages about the value of *elite* forces in general. Their key importance as ' lock-openers ' has been repeatedly proved in the history of warfare, and more than ever in recent times.

(*e*) No fresh problem in war has been effectively tackled if treated in a ' general purpose ' way, and entrusted to a Service or arm primarily concerned with other and more familiar problems that habitually come within its sphere. The unhappy history of armoured forces, particularly in Britain and France, is a recent example and lesson. Amphibious warfare is one of the basic problems that call for specialized treatment.

These conclusions lead on to a further reflection. It has come to be recognized that the old distinction between land and sea operations is no longer suitable. But the recent three-fold division into land, sea, and air operations fits no better and is already out of date. While operational problems are different, their differences cannot be solved on three separate lines. Problems need to be tackled in a more integrated way, blending the functions of the three Services.

The U.S. Marine Corps is a three-in-one Service in embryo. It has gained so much experience in combining land, sea, and air action that it forms a nucleus and a pattern for further development. Logically it should be the basis for further progress in integration. Any reduction of its scale and function would be a retrograde step. For it is the most important advance in military organization since the ' divisional ' system. The division of an army into self-contained fractions, embodying all arms and capable of fighting independently, was introduced near the end of the 18th century and became the key instrument of Napoleon's operations.

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TRENCH GASCOIGNE FIRST PRIZE ESSAY

By Instructor Lieutenant N. G. Brown, R.N.

" Sea power will be vital for the Western Alliance in any future all-out contest between East and West " (Field-Marshal Montgomery). Discuss this in the light of the Communist threat.

I

AFTER all the ideological and political turmoil of the first part of the 20th century, the primary objective of Western foreign policy, in the post-war period, has reverted to being the same as that which Britain faced during most of Queen Victoria's reign—namely, a solution of the ' Eastern Question.' The problem posed by the ' Eastern Question ' was that of how to encourage the progress of newly developing nations without condoning Russian expansion. It appeared, in its strategic aspect, as one of how to ensure the security of the essentially maritime British Empire in the face of the emergent land-power of the Eurasian interior. This preoccupation, which was articulated in its most precise form by Sir Halford Mackinder, remains ours today, except that we think predominantly not in terms of the British Empire or Commonwealth but of the Western Alliance.

The Mackinder thesis was first enunciated in 1904,[1] and subsequent restatements showed considerable changes in terminology but little in substance. The basic tenet was that the interior of Eurasia, the ' Heartland ' as he called it, was a great natural fortress delimited by the watersheds of rivers draining either into the Arctic or into stretches of water with no outlet to the open sea. Its natural protection, which made it invulnerable to incursions by sea power, derived largely from the Arctic and from the Himalayas. On the other hand the Heartland, once it had organized its gigantic resources under unified political control and, in particular, once it had exploited its great potential advantages over the oceanic areas in the field of communications, would hold the key to world supremacy. Since the Heartland area is at present almost entirely in Communist hands, it is most pertinent that we re-examine Mackinder's argument. (Subsequently we will speak of the Heartland and the Soviet bloc as synonymous, which is graphic though not literally true.)

The first question to consider is whether the argument was conducted within the correct framework. Mackinder saw geopolitical strength as being essentially a simple compound of land power on the one hand and sea power on the other. It is impossible to prove or disprove a basic postulate of this kind, but one can enquire as to whether it is likely to prove the most helpful one for the period about to be examined. The answer to this enquiry is clearly directly dependent on how far into the future the analysis is to be projected, and it is suggested that prediction as far ahead as the early 1970s should be carried out. This is necessary because the lead-time for the development of a modern weapons system is typically about ten years, and the time required for procurement and familiarization is several years longer. Therefore we must contemplate now what kinds of weapons will successively enjoy priority demands over the next 15 years, and this involves us in a consideration of what kinds of wars are likely to be fought during this time. This, in turn, requires an evaluation of the expected rate of development of weapon technology as a whole and of the probable relative rates of development of the major weapons systems within that general field. Whilst any such evaluation is of its very nature presumptuous, it is in the opinion of the writer absolutely essential that it be attempted.

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[1] *Geographical Journal*, XXIII, 1904.

As will be demonstrated subsequently, it does in fact seem that the ambivalent view of the nature of power to which Mackinder subscribed will prove more appropriate over the next decade or two than it was when he last restated his thesis in 1943.[2] At that time it seemed to many that air power had taken its place as a separate entity alongside land and sea power and, indeed, that it was assuming the dominant role forecast for it by enthusiasts like Giulio Douhet and William Mitchell in the years following the first World War. However, the advent of the self-propelled missile has blurred the contrast between aircraft and surface artillery and has thereby made less appropriate a view that command of the air is fought for independently of the surface situation, but that once established it can be used to dominate land and sea campaigns. The increasing specialization of manned aircraft is to be contrasted with Douhet's prescription for two simple types, battle planes and reconnaissance planes, and it promotes a tendency to make aircraft essentially aids of land and sea forces. In short, the significance of manned aircraft, as of ballistic missiles, in the immediate future will no longer be that they represent a new dimension. It will rather be that, by their range and striking power, they will reduce the immunity of land and sea from each other and make less tenable a simple deterministic view of geopolitics whether in favour of land or sea.

The possibility remains that astronautics is on the verge of creating a new medium of warfare—that of outer space. No doubt, were the arms race prolonged indefinitely, we would eventually become concerned with the command of space. Already a futuristically minded American has enunciated a compelling argument in favour of the moon as a site for a deterrent missile force.[3] Very probably, by 1970, manned satellites will be in orbit and a lunar landing may well have been made.[4] However, the day when missiles can be launched from artificial satellites or the moon will still be remote. Although, around 1970, satellites will be making contributions to military science as reconnaissance vehicles, radio relay stations, and perhaps navigational beacons,[5] their role, though important, will remain essentially auxiliary.

Although the framework of Mackinder's argument has thus been upheld as valid, many of his observations and conclusions must now be rejected as obsolete. For example, river drainage patterns are clearly no longer basic determinants of the prospects of sea power penetrating land masses, if indeed they ever were. Since the trans-polar voyage of the *Nautilus* one can regard the Arctic as a negative area. In spite of its special characteristics it is obviously part of the indivisible world ocean. Various other opinions of Mackinder will be rejected, in the course of examining the relative position of land and sea power in each of the different patterns of global conflict that can be anticipated during the period in question. It will be contended that maritime strength is absolutely fundamental to the Western alliance and that, if properly organized, should prove fully capable of containing the essentially land-based threat from the Communist-dominated Heartland.

II

A global war within the next five years would probably begin with thermonuclear exchanges, involving fleets of manned aircraft and long-range rockets, fighting under conditions in which no effective countermeasure existed to combat

[2] *Foreign Affairs*, July, 1943.

[3] Brig. Gen. Honor A. Boushey to Aero Club of National Press Club, Washington D.C., 28.1.58.

[4] National Planning Assn. Leaflet, No. 104.

[5] *New York Times*, 31.12.58.

the long-range rocket. The primary target of any Communist aggression would obviously be the Western deterrent whose ' effective strength ' is therefore equivalent to its expected strength after absorbing the first blow. How great should this strength be ?

Strong traditions in Communist thought maintain that peaceful change is unreal, war an inevitable by-product of capitalism, and total war no danger to the social fabric of Communist countries. Although now renounced as official dogma, they probably still condition thought to such an extent that a deterrent can only fulfil its purpose if it obviously has the power to destroy a large part of the industrial potential of the Heartland. A rough measure of such power would be the ability to destroy the majority of towns with over 75,000 inhabitants, which number about 200 in Russia alone[6]; therefore the ability to deliver accurately several hundred thermo-nuclear warheads to different Heartland objectives is called for.

Today the land-based deterrent consists essentially of a few Intermediate Range Ballistic Missiles and the more than 2,000 Anglo-American strategic bombers concentrated in about 250 bases.[7] With present degrees of accuracy the Soviets should be able to obliterate all the targets thus clearly presented by the expenditure of a thousand or so rockets and these they should possess by about 1962.[8] Thereby the counter-attack could be reduced to such I.R.B.M. as avoided, through their mobility or concealment, immediate destruction, and such manned bombers as were airborne, or could become so, whilst the missiles were in flight. At present only about 30 per cent.[9] of the bomber force is at ' ground alert ' status, though, no doubt, this percentage would increase during a period of mounting tension such as might precede hostilities.

The present strength of the seaborne deterrent consists of the 2,000 planes[10] with nuclear capability on the 20 N.A.T.O.[11] attack carriers. These are positioned chiefly with local conflicts in mind, and lack both co-ordinated command and a unified strategic doctrine. Many of their planes have severely restricted warheads and limited ranges. The ships themselves are vulnerable to close-range missile attack, especially whilst in harbour. Thus, at the moment, the land-based deterrent seems substantially the stronger of the two.

An evaluation of present strategic strength must also acknowledge certain important advantages which manned bombers retain over missiles. Visual observation and human calculation remain invaluable navigational aids, especially since the precise shape of the earth remains unknown, thus precluding construction of a global network of co-ordinates.[12] However, authoritative opinion maintains that, using nuclear weapons, Soviet defences will soon be able to inflict very heavy attrition during raids by subsonic bombers.[13] Hence the need for large-scale ballistic missile programmes.

That naval ordnance is less accurate than its land-based counterpart is a long-established truism, still valid even at the dawn of the missile age. Problems like spatial limitations on the size and shape of shipborne weapons remain, and new

[6] Hanson W. Baldwin, *The Great Arms Race*, Atlantic Books, p. 33.
[7] " Report on the Arms Race," *New Statesman & Nation*, 29.8.59.
[8] Donald A. Ingram, *Flight*, 13.3.59.
[9] Mr. Don Adams, *Flight*, 3.4.59.
[10] B. S. Hurren, *The Navy*, Jan., 1958.
[11] Hanson W. Baldwin, *op. cit.*, p. 40. For United States total.
[12] *War and Peace in the Space Age*, Lt.-Gen. James Gavin, Ch. VII (Hutchinson, 1959).
[13] Hanson W. Baldwin, *op. cit.*, p. 24.

problems have arisen. Convenience of storage and handling set a premium on the use of a solid propellent, as opposed to the liquid varieties whose behaviour in flight is, at present, more easily regulated. Inertial guidance for submarines has already reached a remarkable standard of technical accomplishment, but it is subject to certain sources of cumulative error which will always remain significant. Conflicting opinions are being expressed on how much progress has been made in developing Polaris but it seems likely that the 1,500-mile version, launched from underwater, will reach full operational status in three or four years.[14] No doubt its standard of accuracy will never quite match that of a comparable shore-based rocket, but this should be easily compensated by the greater proximity to the target that it will normally command. In any case it enjoys the overwhelming advantage that its location will almost certainly be unknown in advance to the enemy, thus enabling it to begin retaliation at a time and place largely of its own choosing. On the other hand, there is no sign of mobile land-based I.C.B.M.s being developed for some years at least, and static missile sites will prove very difficult to conceal, at any rate for countries not in the habit of roping off hundreds of thousands of square miles of their territory. If their positions were located, Western ballistic missiles would prove very vulnerable to missiles of the quality and accuracy the Soviets should soon possess, even if installed in the costly ' hard ' sites now being planned. In conclusion, it seems that seaborne deterrence is likely to prove the more effective by the middle of the next decade.

During the late 1960s the balance of the argument is likely to remain with naval deterrence but with a shift of emphasis towards launching the rockets from surface ships. Accurate underwater firing can presumably only take place from a slow-moving vessel which, even if a heavily powered and streamlined nuclear submarine, would inevitably take some minutes to reach its maximum speed. It is therefore likely that, before the submarine had had time to release its full stock of missiles against a series of different objectives, it would be destroyed by the complex and concentrated defence systems which can be expected around wide sectors of the Heartland periphery in five or ten years' time. The danger would be increased by the fact that the ' over-pressure ' from an underwater megaton explosion is liable severely to impair the efficiency of a ballistic submarine located at a depth of 500 feet and some 20 miles away.[15] The range for affecting a surface ship is usually considerably less than five miles.[16] The risk could be reduced by developing longer range marks of Polaris or its replacements, thereby enabling the attack to be delivered from safer distances. However, this would pose many problems, not the least being that any basic modification of the main armament would necessitate the construction of a new generation of ballistic submarines.

On the other hand, surface warships should prove adaptable to successive varieties of rocket and should be able to accommodate ones with ranges above 1,500 miles. This should help to minimize their great strategic handicap of the present time, namely, the difficulty of maintaining continuous vigil off long sections of the Communist coastline (particularly, of course, the Arctic coast, the patrolling of which would present serious problems even to submarines). Launching from surface vessels encounters the technical difficulties occasioned by wave motion but enjoys the

[14] See Mary Goldring, Science Correspondent " The Economist " in " The Navy," Ap. 1959, v. Report in *Economist*, 30.12.58.

[15] General Pierre M. Gallois, *Interavia*, Vol. 14, No. 3.

[16] General Pierre M. Gallois, *Interavia*, Vol. 14, No. 3.

tactical advantage of being possible whilst ships are proceeding at speed, thus reducing the hazard of their being hit by defensive missiles. It is a reasonable, though as yet unproved, assumption that ships as small as 5,000 tons in displacement will be capable of operating weapons like Polaris.[17] If so, and assuming that adequate handling organizations can be installed in the ships concerned, we have potentially a vast deterrent fleet in the hundred or so battleships[18] and cruisers currently in N.A.T.O. possession, to say nothing of a possibility of using converted merchantmen as 'launching pads.' If we add to this armada the 150 nuclear-propelled ships which the United States alone is scheduled to commission during the next decade[19]—and many of these should be able to fire Polaris—we can visualize a striking force of many units well dispersed, which it would be difficult to weaken seriously by a lightning blow.

Of course, technical advances will take place in land-based I.C.B.M.s, but it seems improbable that they will match developments afloat. Solid fuel, land-based, inter-continental rockets can be expected to appear, thus drastically reducing the average 'reaction time' of missiles. However, it is doubtful if this reduction will be sufficient to gain immunity from a knock-out blow. These doubts are increased by the likelihood that the Soviet striking force will become partly submersible, perhaps, as will be seen later, in the form of large underwater missile containers anchored near the coasts of the Western Powers. To avoid destruction on its own launching sites by such weapons, the deterrent might have to bring 'reaction times' down to something of the order of 15 minutes. Even if this proved technically feasible, no margin would be left for seeking political instructions or checking the early warning reports. Thus at best, until such time as a counter-measure is found to the long-range ballistic rocket, the case for basing the deterrent at sea is overwhelming.

III

The most important discovery, during the next decade, is likely to be that of an antidote to the inter-continental missile, either in the form of a defensive missile or a high-altitude shield of free electrons. The latter solution is the more likely. An early warning system for defensive missiles should aim to sight an incoming missile before burn-out which, if it was launched from the Heartland interior, would be almost impossible.[20] On burn-out, the radar-camouflaged warhead is detached as the rocket disintegrates, surrounding the warhead with decoy particles. Not until re-entry do these particles burn up or the warhead retard.[21] To guarantee interception the defence would have to collect accurate data on the offensive projectile, do thousands of calculations[22] based on this data, and accurately release its defensive missiles in accordance with these calculations, all in a matter of minutes. However ready one is to acknowledge the brilliance of modern technologists, it is difficult to imagine them producing, in the foreseeable future, a defence system, based on this pattern, capable of anything like the 100 per cent. attrition rate required.

On the other hand, high-altitude nuclear explosions, carried out by the United States Navy, have produced rapid reinforcement of some of the shells of free electrons

[17] "Battleships Out of Mothballs," *Economist*, 20.12.58.

[18] *Economist*, 27.12.58.

[19] W. Hadeler, Ch. VII.

[20] However, the United States Navy is developing radar said to be capable of detecting missile launchings 5,000 miles away. *N.A.T.O. Letter*, Vol. 7, No. 9, Sept., 1959.

[21] Dr. Tom Margierson, *New Scientist*, 2.4.59.

[22] Lord Stonehaven, *Manchester Guardian*, 14.10.57.

in the ionosphere. Although published results are inconclusive,[23] it seems improbable that such shells would trigger off a nuclear warhead,[24] but very likely that they could impair a missile's accuracy through interference with its instrumentation and through increased skin friction.[25] It might be said that this would not much matter since the missile could rely on fall-out effect rather than blast effect. However, the U.S.S.R. could, albeit at great expense, construct by 1970 a shelter system against which fall-out would be relatively innocuous. An aggressor State would always have a considerable advantage in alerting its passive defence organization.

Since we cannot dogmatically assume, however, that a defence against the intercontinental missile will be perfected at all, or, if it is, that the success will be registered by the West first, it is necessary to investigate what strides will be made in missile offensive capability. The most obvious trend is one towards more powerful warheads. The possibility of making a rocket with a ' gigaton ' (1,000 megatons) yield has been discussed.[26] Its thrust would obviously come from a novel source—very possibly monatomic hydrogen.[27] Being extremely unstable, such a fuel could presumably only be used on land and by the side striking the first blow.

The chief impact of a ' gigaton ' rocket on sea power would be to make even a task force dispersed over hundreds of miles vulnerable. For underwater explosions of about nominal strength, the distance from the burst at which a given overpressure is experienced varies as the cube root of the explosive force.[28] If this relationship holds true at higher ranges of power, it would seem that a ' gigaton ' bomb could immobilize most ships within a 50-mile radius. Therefore, the average task force would have to disperse so widely as to make its perimeter desperately vulnerable to penetration by submarine.

A type of missile which has already been alluded to is that launched from an underwater container. This idea of the Germans is now being enthusiastically developed by the Russians.[29] It enjoys perfect concealment (except from hostile sonar if near or outside territorial waters) and can be transported relatively easily and cheaply. One authority states that, even if located, it can better withstand thermonuclear attack than a complex ballistic submarine.[30] The Soviets visualize towing it near hostile shores, thus using it as a true seaborne weapon.[31] In Western hands it would presumably be dispersed around friendly, but uninhabited, shores, and thus become strategically a land-based weapon, although logistically and operationally obviously a naval commitment.

Various estimates[32] agree that, if screens of anti-missile missiles are feasible at all, they should be capable of shooting down any ballistic missiles launched from not less than 200 or 300 miles away. A similar minimum horizontal range would probably be necessary before a ballistic missile was obliged to pass through any reinforced

[23] *New York Times*, 30.4.59.
[24] See (I) and (V).
[25] Scientific Correspondent, *Manchester Guardian*, 1.5.59.
[26] National Planning Assn. Leaflet No. 104.
[27] Derek Wragge Morley, *The Soviet Navy*, Ch. X (Weidenfeld & Nicolson, 1958).
[28] *The Effects of Nuclear Weapons*, Ch. V, United States Atomic Energy Commission, June, 1957.
[29] R. L. Garthoff, *Soviet Strategy in the Nuclear Age*, Ch IX (Atlantic Books, 1958).
[30] Gen. Pierre M. Gallois, *Interavia*, Vol. 14, No. 3.
[31] R. L. Garthoff, *op. cit.*, Ch. IX.
[32] *Ibid.* Ch. X.

electron shells in the ionosphere.[33] If, however, the antidotes were effective beyond such ranges, it is obvious that the vast majority of the Heartland would be immune to ballistic missile attack. The only other vehicles which could be employed to deliver the deterrent would be winged missiles or manned aircraft, of which the latter would be much preferable on grounds of accuracy and flexibility. Modern conditions force bombers either to fly very high to avoid anti-aircraft shells or very low to avoid radar.

Low-altitude attack is hazardous, especially at the Mach 1.5–2.0 speeds necessary to avoid modern aircraft fire.[34] However, problems such as crew fatigue, navigational and bombing inaccuracies, buffeting, and rain erosion can be countered by careful design or operation. Fuel consumption is at present terrific, but this should fall in time. Overheating, due to air resistance, can be combated by a much wider use of titanium and steel. In the opinion of the writer it should be possible to produce, by 1970, a low-level supersonic bomber with a radius of action of 1,500 miles and an all-up weight of about 200,000 lb. The defence would be unlikely to inflict an adequate attrition rate against such a weapon engaged in a thermonuclear strike.

The deep Heartland interior would be accessible to high-altitude nuclear jet bombers. The Himalayas seemed to Mackinder a great protective wall, but to such bombers they would become an avenue of advance, for over them they could combine the high speeds possible in rarefied air with the radar immunity derived from operation fairly low above rugged topography.

How strong is the argument for basing such a strike force at sea? As assumed above, unless a major technological breakthrough was achieved, it would be impracticable to install nuclear reactors in the bombers of the low-altitude force, as these would be of limited size due to financial and operational considerations. Therefore, fuel wastage would preclude standing patrols, leaving the planes in peril of destruction whilst grounded. Admittedly, vertical take-off capability could give even landplanes prospects of camouflaged dispersal and, indeed, the Hawker Company are currently developing a light supersonic strike aircraft with this capability.[35] Nevertheless it is doubtful whether it could be extended in the foreseeable future to the low-altitude supersonic bomber without critical sacrifices in the plane's performance.

The jet engine has emancipated flying boats from the clumsy hull contours imposed by propellers. Consequently there has been some measure of agreement that, above a certain all-up weight[36] (estimates vary between about 150,000 and 400,000 lb.), a flying boat has better load and speed characteristics than a comparable landplane which anyhow needs long and strong runways. It is true that, in spite of a mutual long-standing interest in such planes, both the U.S.A. and the U.S.S.R. seem to have made only slow and erratic progress with flying boat development in the post-war period,[37] but this is probably largely due either to purely short-term technical difficulties or to uncertainty as to the flying boats' strategic role. The decisions by the two major Powers to make their respective current nuclear bomber projects land-based seem[38] to have been based on the argument that water acts as a

[33] National Planning Assn. Leaflet, No. 104, App. on Missiles.

[34] F. O. Miksche, *The Failure of Atomic Strategy*, Ch. V (Faber).

[35] Derek H. Wood, *Interavia*.

[36] Air Vice-Marshal P. H. Mackworth, *Journal of the Royal United Service Institution*, May, 1951.

[37] See successive editions *Jane's All the World's Aircraft*, 1950–59.

[38] J. L. Nayler & T. F. Saunders, *Handbook of the Aircraft Industry*, 1958 (G. Newnes, Ltd.).

dangerous carrier of radioactive contamination in the event of accident. However, the published evidence from the Baker test at Bikini[39] makes it equally plausible to argue that water currents can often so rapidly disperse the contamination as to much diminish the danger from residual radioactivity. In summation, it is suggested that technical factors establish a case for having the proposed high-altitude strike force water-based and reinforce the case for a sea-based low-altitude strike force already made out on strategic grounds. An especially interesting innovation strategically is that of pantobased aircraft capable of operating not merely from water but also from other level surfaces, such as ice.[40] There are also often political drawbacks to strategic land bases in that they are often held on lease, may incur local unpopularity, and by giving credence to the ' capitalist encirclement ' theory may strengthen the hand of Stalinist elements in Moscow and Peking.[41]

The availability of sheltered anchorages favours basing a flying boat force in the Indian and central and southern Pacific oceans. Furthermore, by 1970, waters peripheral to Eurasia, the Indian Ocean excepted, are likely to be frequently patrolled by missile-carrying Sino-Soviet submarines. Rather than risk sudden conflict with a force that was merely auxiliary to the Communist arsenal, the deterrent would clearly do better to locate itself in waters of vaster area and greater remoteness.

In the event of thermonuclear attack, a retaliatory strike force would set out toward the Heartland from the mobile floating bases situated in southern seas. The high-altitude units would attack directly, but the low-altitude units would first refuel from nuclear-powered aerial or submarine tankers in advanced anchorages, or on ice-fields, around the Heartland periphery. Such forces could well constitute the most efficient form of thermonuclear deterrent by the year 1970.

Given defence systems effective against missiles launched more than 200 miles away, would the West be less vulnerable than the Communist bloc ? In the case of countries around the Iron Curtain, the answer is obviously ' No.' However, North America would be more defensible against aircraft, largely because of distance, and because planes approaching over the sea are relatively exposed to low-level detection. Another natural defence against low-level attack is North America's generally more maritime climate although, admittedly, her Arctic regions have far less average cloud amounts than Russia's.[42] Nevertheless, North America could be crippled by an underwater attack launched close inshore. Forty-three of the 50 largest United States cities lie within 85 miles of the coast.[43] One countermeasure which is receiving official consideration[44] is that of continuous surveillance of all submarines moving submerged in adjacent oceans. However, the evasive powers which nuclear submarines derive from sustained speed, manœuvrability, and deep-diving capability are formidable now, and will become more so in time. Another possibility is a detection-and-kill cordon along strategically important coastlines, composed of ships, platforms, amphibious helicopters, planes, and sonar buoys. It could make an enemy fearful of telegraphing a blow by concentrating his submarines and, furthermore, could reduce these craft to the status of one-strike weapons. The anchoring of underwater containers could be prevented, as such action could be treated as provocative

[39] *The Effects of Nuclear Weapons*, Ch. IX, *op. cit.*

[40] Sqn. Leader L. W. Davies, *Naval Review*, No. 1, Vol. XLVI, Jan., 1958.

[41] J. V. Stalin, *Report to 18th Congress, Communist Party of The Soviet Union*, 1939.

[42] Map based on work by C. E. P. Brooks, *The University Atlas*, George Philip & Son Ltd., 1948.

[43] Lt. Roy Beaver, U.S.N. in *United States Naval Institute Proceedings*, July, 1959.

[44] *United States Naval Institute Proceedings*, Sept., 1958.

on purely common-sense grounds, and as international law allows a nation some special jurisdiction[45] over the sea-floor of its continental shelf. However, the cordon would represent a departure from classic strategy, which seeks security through positive command of the sea. It would probably never be made fool-proof and would be very expensive both to create and maintain.

If electron shells prove effective anti-missile barriers, the seas around the magnetic poles may become important theatres of operation, because it seems probable that the shells would not extend over these polar areas.[46] Therefore, missiles launched thence could have unobstructed flight over the first part of their trajectory —the most important part from the standpoint of accuracy. In contesting the Canadian Arctic, the West would start off in possession, in a region unfavourable to mobility, but the Soviets have substantially more accumulated experience of Arctic operations,[47] and especially of airborne supply.[48] A battle for control of the relevant areas of the Antarctic would presumably take the form of a struggle against Communist submarines. Control having been established, the missiles could be launched from one or more of a variety of ' pads,' including aircraft, air transportable mobile ramps, ships, submarines, or underwater containers. All these weapons systems, even if extant, are still in an early stage of development and it would be idle to speculate as to their relative aptitude for this particular role at some hypothetical date in the future. One cogent consideration would be their adaptability to the winter freeze, which grips the polar seas alternately, and could compel a duplication of the whole deterrent investment.

IV

A view still prevalent, particularly in Russia,[49] is that a total war would be fought in two stages. First a two-way atomic bombardment would take place until such time as all stocks of nuclear explosives were exhausted. Then would follow ' broken-backed ' warfare fought with ' conventional ' weapons and culminating in the occupation of the territory of the vanquished.

If war broke out any time during the next two or three years it might indeed take that form, for both sides would still possess relatively modest nuclear stockpiles and relatively primitive means of delivery. Subsequently, however, a ' broken-back ' phase would be very unlikely to occur. Even in the distant future one can imagine offensive nuclear power being kept down to a finite level either by the operation of a successful missile defence system or following a period of partially effective armaments control. However, either of these eventualities would not automatically produce a ' broken-back ' final phase in any conflict. For that to happen it would also be necessary for both sets of belligerents to exhaust their nuclear stockpiles almost simultaneously and at a time when they both retained the effective will to resist. Such a delicate combination of circumstances is so unlikely to occur at any time after about 1965 (bearing in mind the vast accumulation of nuclear weapons that could have taken place by then) that in investigating the features that would distinguish ' broken-back ' war from ordinary ' conventional ' war we can safely confine our attention to the years immediately ahead.

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[45] A. H. Dean, *Foreign Affairs*, Oct., 1958.

[46] *New York Times*, 19.3.59; *Isvestia*, 8.3.59, quoted in *Current Digest of Soviet Press*, Vol. XI, No. 10.

[47] Letter from M. R. K. Burge, *Sunday Times*, 8.8.59.

[48] Sir Philip Joubert in Asher Lee, *The Soviet Air and Rocket Forces* (Weidenfeld & Nicolson), 1959.

[49] R. L. Garthoff, *op. cit.*

During the first few days following the cessation of atomic warfare utter chaos would prevail due to the shattering of command structures, defence lines, and supply systems. It would be a time of opportunity for the bold and daring, and an important technique at this stage could be the amphibious strike. Being essentially impromptu, the strikes would inevitably be small scale in terms of resources. They would probably seize wide and deep beachheads, however, because both sides would be inhibited from concentration by the fear that the other side still held nuclear weapons in reserve.

As far as the West was concerned, the natural objectives for such strikes would be the more exposed Soviet naval bases, assuming these had been damaged already by nuclear attack. The intention would be to hold them for a few weeks, thereby postponing repair and causing severe disorganization in the Soviet submarine fleet. The ideal spearhead for such a strike would take the form of vertical envelopment by the helicopters of a commando carrier. The best vehicle for reinforcement would be the troop-carrying submarine. Some time ago the United States converted two of their older boats to this role[50] and a strong case exists for having more such craft in the N.A.T.O. navies.

Soviet wartime experience in ' combined operations ' consisted largely of tactical outflanking movements along lightly defended coasts using improvised resources.[51] Since 1945 their organization has become more sophisticated and so has their equipment,[52] as witness the procurement of a hydrojet amphibious tank.[53] About seven divisions with adequate transport for seaborne assault are distributed around the Soviet littoral.[54] In time of crisis the number of troops could be rapidly expanded and, no doubt, the ' sealift ' could, too. For example, thousands of vessels from the large and rapidly expanding Soviet motorized[55] fishing fleet could be mobilized. The purpose of amphibious assaults would probably be to secure key positions for facilitating the egress to the high seas of the Soviet submarine fleet. Such operations would require complete naval dominance of the theatres of operation in question and the most effective way of undermining such dominance would be by the employment of an arm of naval power which has been pitifully neglected by the N.A.T.O. powers, namely, coastal forces. The latent possibilities of such craft have been enhanced in recent years by technical advance in design[56] and in materials.[57] Their speed, punch, and relative immunity from radar detection and minefields make them most useful instruments of counter-offensive in narrow and shallow seas.

With the reimposition of effective central direction over the depleted defences on each side, the scope for opportunist attacks would sharply diminish and both sides would concentrate for a while on rebuilding their strength. Bearing in mind the fundamental importance to the West of sea transportation, one of its most critical problems at this stage would be a deficiency of port capacity. Port congestion is a perpetual threat in any major war, but after nuclear exchange the problem would be much aggravated by the fact that since ports are generally geographically peripheral

[50] *Jane's Fighting Ships*, 1958–59.
[51] J. Meister, *The Navy*, Oct., 1957.
[52] *Ibid.*
[53] Hanson W. Baldwin, *op. cit.*
[54] J. Meister, *op. cit.*
[55] *The Soviet Navy*, Ch. IV, ed. Cdr. M. G. Saunders, R.N. (Weidenfeld & Nicolson), 1958.
[56] *United States Naval Institute Proceedings*, Ap. 1959.
[57] *News Chronicle*, 27.7.54.

they would have suffered proportionately more damage than the economy as a whole. Air or ground burst nuclear explosions in or around a port would inevitably severely impair its handling and clearing capacities, but once the fall-out danger had receded ships would normally be able to enter the port and, if appropriately equipped, to unload themselves. A large underwater explosion in a confined port area would, however, lead to long-term immobilization due to sunken ships and collapsed substructures. Such explosions could often be most conveniently produced in a way Soviet tacticians are currently contemplating—namely, submarine launched and rocket-propelled mobile atomic mines.[58] This threat emphasizes the continuing importance of boom defences.

An illustration of the crippling effect of the destruction of a few major ports even on the resources of a country like Britain can be provided by a study of the port facilities of the south-west peninsula—historically, perhaps, the greatest source of British maritime endeavour. Around the shores of Devon and Cornwall the normal peacetime recorded traffic is about 7,000,000 net register tons[59] per annum (about 7 per cent. of our normal peacetime imports)[60] and only five ports are on record as ever having accommodated a vessel larger than 2,000 tons displacement.[61] The dependence on big ports is enhanced by a trend towards increasing specialization and increasing size, as witness, for example, the current construction of ultra-large tankers.

Of course remedies exist. Port construction under economic aid programmes is especially important. Over-the-beach handling facilities, such as have been developed in France[62] and Turkey[63] are likewise significant. Some years ago the British Government announced the spending of some millions of pounds on developing ' shadow ' ports.[64] Such solutions are made easier by recent technical progress with equipment like landing craft,[65] beachlighters,[66] and attack cargo vessels.[67]

Warfare on the open seas, in the aftermath of a nuclear exchange, would be conditioned by the physical effects of that exchange and by the suspicion that it might recommence. Convoys travelling in dispersed order as a precaution against renewed atomic attack would be very vulnerable to penetration by conventional submarines. It would be possible, too, that they would be threatened by another menace in the form of the surface raider resuming its old place in war with the diminished effectiveness of maritime aerial reconnaissance consequent on the destruction of many aircraft and bases. However, the ' Sverdlov ' class of cruiser, which are about the only potential deep sea surface raiders the Communist powers possess, are very inadequate in range[68] and have the disadvantage of low steam pressure,[69] and so would be unlikely to emerge in that capacity even if they had been kept in

[58] R. L. Garthoff, *op. cit.*

[59] Sir David J. Owen, *Ports of the United Kingdom* (Allman & Son, Ltd.), 1939; E. G. Godrely & Capt. K. Macdonald, *Ports Dues and Charges on Shipping throughout the World* (George Philip & Son, Ltd.), 1959.

[60] Lord Louis Mountbatten, *Journal of R. Commonwealth Soc.*, May–June, 1959.

[61] E. G. Godfrey, *op. cit.*

[62] David Woodward, *Ramsay at War* (William Kimber), 1957.

[63] Hanson W. Baldwin, *Foreign Affairs*, 1957.

[64] *News Chronicle*, 27.7.54.

[65] Capt. D. S. Bill, Jr., U.S.N., *United States Naval Institute Proceedings*, Nov., 1958.

[66] *Ibid.*, June, 1959.

[67] *Ibid.*, July, 1959.

[68] *Jane's Fighting Ships*, 1958–59.

[69] W. Hadeler, Chap. VII, *The Soviet Navy*, *op. cit.*

commission. As far as the depletion of our surface fleets by atomic bombardment goes, the combat vessels most likely to survive comparatively unhindered include those supported by mobile bases afloat or smaller craft which can be supported by small and well-dispersed shore bases. The Swedish policy of having an essentially 'mosquito' fleet based largely on underground harbours[70] is an extreme application of the latter principle. It is made possible by the strategic requirements of Baltic defence and such technical facts as the virtual absence of tides, the form of the coastline, and the nature of the bedrock.

Another consequence of nuclear bombardment, which especially affects sea warfare, is the disruption of wireless transmissions, at least in the low-frequency bands, for at least some weeks following a series of high-altitude[71] nuclear explosions. This is a special illustration of the fact that in this era of nuclear and electronic warfare sea power is handicapped by its over-dependence on wireless as opposed to cables. Among current responses being developed to this challenge are long-wave wireless transmissions under the sea[72] and the laying of more submarine cables between shore bases.[73] Also the moon is being experimentally used as a high-frequency reflector,[74] although it is not always available when required. Nevertheless, the opinion of Mackinder that the Heartland was superior to the oceanic area in communications is true today, if the statement is distorted to mean communications in the narrowest sense.

V

A tactical atomic war is one fought with rigid limits existing on the size of warheads, the nature of targets, or the depth of the battle zone. Such a war could be an 'all-out' conflict in the special sense that it was waged all along the Iron Curtain and across immediately adjacent lands and seas. The exact pattern it would take at sea is uncertain, because no one can say what definition would be applied to the term 'tactical.' However, certain general statements can be made, particularly about convoy protection, working from the premise that, as in land warfare, the increased firepower would favour the defence. Thus, a Soviet estimate of the lethal radius of a nuclear depth charge as 600 metres,[75] though it may well be conservative, suggests an increase in defensive power almost sufficient to reduce the submarine to a suicide weapon. This would be especially true if an escort screen, spread widely round a well-dispersed convoy, forced the submarine to fire a flying torpedo, in order to achieve the required range, for the source of such a projectile could be quickly located. However, dispersion would at times be difficult due to narrow fairways and, unless a revolutionary breakthrough was achieved in detection equipment, would always necessitate large escort groups. Nevertheless, the total number of ships in convoy would be far less than in a non-nuclear general war. Industrial activity would not have to be maintained because the fighting would be destructive, and consequently short, and fought with existing stocks of weapons. Also, with fewer troops in the field, supplies required would be generally small in both tonnage and size of items and, therefore, largely air transportable. Petrol would remain in high demand, if the ground units

[70] *United States Naval Institute Proceedings*, Vol. 84, No. 9, Sept., 1958.

[71] *New York Times*, 30.4.59.

[72] Sir Robert Watson-Watt, *Foreign Affairs*, Jan., 1954.

[73] *Newsweek*, 20.3.59; *The North Atlantic Treaty Organization*, Reference Division C.O.I., Lond., Sept., 1958.

[74] *New Scientist*, 28.5.59.

[75] R. L. Garthoff, *op. cit.*, Ch. IX.

became helicopter borne, but the giant nuclear submarine oil tankers likely to be appearing in a few years' time[76] would make very suitable transporters under operational conditions for this commodity.

However, in the opinion of the writer, the West would be unwise to continue reshaping their forces for tactical atomic war, a trend which progressively weakens their aptitude for conventional war. This is not to say that, faced with global aggression with non-nuclear weapons, the West should not use atomic weapons as a signal that either aggression would cease or else the thermonuclear deterrent would be unleashed. What is suggested, however, is that subsequent to the employment of these weapons, either aggression would cease or else the scope of the conflict would rapidly widen until it became total in every sense. There would never be a prolonged period in which a nuclear conflict was being waged with rigid limits existing on the size of warheads, the nature of targets, or the depth of the battle zone.

This assertion is based partly on the fact that, though illogical, the term ' conventional weapons ' is still very often used to describe all armaments except those dependent on bacteria, toxic gases, or atomic reaction, which are referred to as weapons of mass destruction. This distinction reflects a widespread belief that war involving the latter group of weapons must, if it continues, soon become total. This feeling can be backed up by solid argument. The emotions and confusion of war militate against restraint. The Communists, in particular, would be likely to use ever-larger nuclear warheads. Such a policy would harmonize with their less extensive and varied manufacturing capability for tactical atomic weapons, which is due to the fact that they do not believe in the concept of a tactical atomic war.[77] Also it would relieve the drain on their technically skilled manpower which, in China at least, is in short supply. Furthermore, it would suit their tradition of centralized command. Lastly, dependence on East European,[78] and even South African,[79] supplies suggests that until such time as large-scale breeder production of plutonium begins, the Soviet bloc will not have enough fission material to use uneconomically on low-yield weapons. In any case, even given the most amicable agreement between the two sides about the principle of limiting atomic war, the definition of those limits would present fantastic problems.

Assuming that the Western deterrent was effective enough to prevent a full-scale thermonuclear onslaught, it seems to the writer that the most likely kind of military conflict in the next ten years is that of simultaneous local wars. If militant Stalinism revived in Moscow, reinforcing strong Stalinist tendencies now dominant in Peking, the resultant policy would be to await a period of political confusion or economic recession in the West and then promote, in quick succession, a series of boundary disputes or civil wars along or near the Iron Curtain. Eventually Sino-Soviet forces would be introduced using conventional arms. In countries not contiguous to the Iron Curtain, these forces might be purely naval. Such a policy would stem from awareness that the West now has the capacity to deal with an isolated local war, but would be hard pressed if fighting on several fronts at once.

However, the West would do better not to use tactical nuclear weapons in response to such aggression. If the aggression was at all disguised, whichever side used nuclear weapons first would incur great odium among neutral nations. Further-

[76] *New Scientist*, 21.11.58; *United States Naval Institute Proceedings*, July, 1959.
[77] Marshal Malinowsky, quoted in *Current Digest of the Soviet Press*, 22.4.59.
[78] *Statesman's Year Book*, 1958.
[79] Admiral E. Biörklund, *Journal of the Royal United Service Institution*, Feb., 1957.

more, they might not produce a cessation of hostilities if the Sino-Soviet Governments failed to discipline their local supporters. The effects on civil life would be ghastly. Imagine, for example, a kind of 'hotted-up' Thirty Years War fought between independent mobile columns skirmishing with nuclear weapons across Germany. Also, the West would be inhibited from deep penetration aerial strikes which, as will be argued later, could exploit the weaknesses inherent in the close-knit and continental nature of the Heartland.

VI

Preparedness to fight conventionally on several fronts could only be achieved by increasing the number of Regular and reservist combat troops readily available. Today, N.A.T.O. troops with the colours are about 30 per cent. fewer than those of the East European Security Treaty forces[80] and the latter have a substantially higher proportion of combatants. Pro-Western Asiatic ground forces are about half as numerous as those of the purely Asian Communist Powers.[81] On the other hand, if Western ground forces accepted a defensive role, they could probably contain two or three times their number of similar quality troops, because the balance in conventional land war is swinging in favour of the defence again. This is due to such technical developments as recoilless rifles, land-mines with plastic cases and complex actuations, wire-guided missiles, and (though this weapon is currently illegal) painless psycho-chemical gas.[82] Therefore, it seems that the expansion of forces required of the West would be a relatively modest one, particularly since the Communists would find it impossible to provoke simultaneous conflicts all round the Iron Curtain. An American estimate that the number of United States divisions would have to be increased by a half to fight conventional wars seems reasonable in the light of the above assumptions.[83] Nevertheless, quick responses would be required against thrusts by Soviet forces, for no major territorial losses could be tolerated. Such losses would sacrifice friendly peoples to subjugation, possibly lead to the loss of vital raw materials, and probably improve Communist access to warm water. Therefore the maritime nations would have to prove themselves markedly superior to the Heartland in strategic mobility.

The strategic reserve of the metropolitan Western Powers would increase proportionately more than overall ground strength because, for political, financial, and personnel reasons, the increment would be largely home based. When hostilities began at any particular place, a token force to encourage local resistance could be dispatched either by air or from any naval task force patrolling nearby, but the main build-up would depend very predominantly on long-distance sea transport. The available air fleets would be inadequate in aggregate payloads and in ability to move heavy items. The most relevant ships are probably cargo liners of 10–15,000 gross register tons, but nuclear-propelled types are needed to achieve higher sustained speeds than is realized by contemporary methods of propulsion. In ships of such a size this would necessitate water-cooled reactors,[84] which will long remain uneconomic. Strong Governmental encouragement would be necessary to promote their adoption and to help find ways to lower sea surface resistance, which would then become the critical factor in limiting sustained high speeds.

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[80] *Statesman's Year Book*, 1958–59.

[81] *Ibid.*

[82] B. H. Liddell-Hart, *Survival*, Vol. 1, No. 4, Sept.–Oct., 1959.

[83] Democratic Party pamphlet quoted in "Tomorrow's Strategy," *The Economist*, 8.8.59.

[84] A. J. Arthur, *The Scotsman*, 27.5.59.

The biggest menace to maritime commerce is the submarine. Currently, this threat is directed chiefly towards the Atlantic and the Mediterranean but a gradual reorientation towards the North Pacific may well take place. This is the only ocean with a long ice-free Communist coastline. Allied ground forces dispersed around the north-western Pacific are exceptionally exposed to isolation. Also, by comparison with relevant areas of the Pacific, the East Atlantic is too crowded with ships and has too wide a continental shelf to give a submarine, particularly a nuclear-propelled submarine, enough freedom of movement for a conventional campaign. Likewise, the ideal flying conditions of still, clear seas and confined sea areas, characteristic of the Mediterranean, favour the defence.

However the great attraction of the Pacific for the Communists is that, in view of the relatively thin anti-aircraft defence screens the allies could maintain, their reconnaissance planes could more easily reach the open sea, thereby vastly increasing the operational efficiency of submarines present. The Soviets are interested in prospective nuclear flying boats,[85] which could no doubt prove of great value, having both high speeds and, if carrying a relief crew, exceptional duration. Furthermore, assuming its radar set was sufficiently discriminating, and ships in convoy are good radar targets, a nuclear jet flying boat flying at 2,000 m.p.h. at 80,000 feet could search 20 times as much sea per hour as, say, a plane travelling at 300 m.p.h. and 10,000 feet.

We cannot predict the exact pattern of the Soviet nuclear submarine construction programme, but one possibility is the creation of a fleet designed for torpedo attacks on convoys. The fantastic manœuvrability and speed of these craft will make them difficult to hit with high explosive depth charges and homing torpedoes. Speeds around 70 knots[86] and diving depths well beyond present reported limits of around 700 feet[87] must eventually be expected. Therefore the only vessel with a good prospect of killing a nuclear submarine is another nuclear submarine. Small anti-submarine models of about 500 tons have been projected and, if developed, could, in fact, provide excellent protection against all types of submarine.[88]

The gravity of the Communist submarine threat (which at present is essentially a Russian one) should not be over-estimated. Most of the U.S.S.R.'s bases are largely land-locked and most, too, often ice-bound. The N.A.T.O. long-range submarine force (currently 165 strong)[89] could blockade many of these bases effectively, although blockade would become less easy if base facilities in China expanded. Moreover, the quality of the Soviet submarine fleet is doubtful, in spite of the propaganda build-up it enjoys. A recent barrage of specific criticisms by Rear-Admiral Kuchevenko[90] suggests that efficiency is low, as might be expected in consequence of inadequate combat experience, no tradition of success, and insufficient scope for operational training.

The role of navies in direct support of armies must be examined. Combined operations would be limited as neither side would enjoy the overwhelming aerial superiority required. The Communists would probably indulge in costly landings aimed at turning tactical flanks. The amphibious capability of the West would

[85] E. L. Garthoff, *op. cit.*, Ch. IX.
[86] Lt.-Cdr. L. A. Wintle, R.N., *The Navy*, Feb., 1958.
[87] *Jane's Fighting Ships*, 1958–59.
[88] Richard Witkin, *New York Times*, 1.4.59.
[89] J. Meister, *The Navy*, Nov., 1957.
[90] Article in *Red Star*, quoted in *Survival*, Vol. 1, No. 3.

probably be largely employed in supply under bombardment or, if necessary, the evacuation of isolated enclaves as in the case of the Xth Corps at Hungnam in Korea. The direct support role of the aircraft carrier amounts to the provision of extra tactical air power when forward airfield facilities are inadequate. Naturally, this role will cease when vertical take-off capability is achieved for light tactical aircraft. Meanwhile, the usefulness of the carrier is conditioned by its vulnerability, the evaluation of which is largely a study in electronic warfare. Other things being equal, the odds would seem to be against the carrier. One would expect powerful shore equipment, aided by picket submarines, to locate a carrier by tracking its aircraft and intercepting its signals and then to jam its early warning and gunnery control radar and its wireless. One would expect attacking bombers to use guided bombs sufficiently refined to be very difficult to jam. However, other things are not equal. Carriers would probably be employed in the Far East largely against Chinese forces who, for many years yet, will be very backward electronically.

Since close support implies much inshore operation, it is pertinent here to stress the gravity of the Soviet mine menace. Soviet cruisers and destroyers alone can carry a total load of 17,000 mines[91] to say nothing of submarines, aircraft, and coastal forces. The total number of sea-mines laid by the Germans off north-west Europe in the whole of the last war was 120,000.[92]

Containment could be achieved on land and sea but an instrument of counter-offensive would be needed. A strategy of pure containment would exclude the clear possibility of victory and would, at least in the case of anti-submarine warfare, involve a disproportionate wastage of resources by the defence. It would also mean a long war, which would benefit totalitarianism. The answer lies in attacking Heartland communications.

In spite of the evidence from the Crimea and elsewhere, the pet bogey of the 19th century British Foreign Office was an aggressive Russian army, enjoying a strategic mobility superior to anything we could match. Mackinder inherited these fears and conceded the Heartland, at least potentially, superior communications. Today, except in some limited aspects, this potentiality shows no sign of realization, not even in Russia. Soviet five-year plans, fearful of the heavy investment which transport *media* demand, plan for expansion at minimal required rates, make transport prone to investment cuts, and seek expansion through increased efficiency rather than increased mileage.[93] Thus, although the traffic density is the highest in the world,[94] railway capacity is chiefly being expanded by electrification and automatic control,[95] which increase the system's vulnerability.

A conventional strategic offensive on Heartland communications would require low-altitude and high-altitude bombers of similar performance to those suggested as vehicles for the thermonuclear deterrent. Low-altitude sweeps could use rockets, cannon, napalm bombs, and sea-mines variously against ships, trains, barrages, locks, power-lines, and other equipment. The core of the defence would probably be fighters with homing missiles. Homing would be difficult through the complex interference patterns found near the ground, and the pulse wave variety of radar suitable for homing is prone to jamming.[96] Progressive miniaturization of airborne equipment

[91] *Jane's Fighting Ships*, 1958–59.
[92] Capt. J. S. Cowie, *Mines and Minelaying*, Ch. VIII (O.U.P.), 1949.
[93] Holland Hunter, *Soviet Transportation Policy*, Ch. XV (Harvard U.P.), 1957.
[94] N. Baranski, *Economic Geography of the U.S.S.R.*, Ch. IX.
[95] Holland Hunter, *op. cit.*, Ch. XV.
[96] S. C. Dunn, *Interavia*, *op. cit.*

favours the prospective installation in the bombers of defensive and decoy missiles. No doubt, these bombers could not risk attacking large targets heavily defended by anti-aircraft guns and radar-camouflaged balloons, but that would be inessential to the fulfilment of their mission.

The high-altitude force could strike against clearly identifiable nodal points on communication routes in the central Heartland, such as the new railway links between the U.S.S.R. and China. At very high altitudes, anti-aircraft missiles would lack directional control, and anyhow would be vulnerable to jamming and to the sizeable defensive missiles a large bomber could carry.

A strong argument can be made out for having most of the low-altitude bomber force sea-based. Bomber bases could be built on land, which could not be crippled by heavy bombing[97] and they could be provided with concentrated anti-aircraft defences. However, such bases would be difficult to operate from if they were exposed to frequent strafing and tip-and-run raids. The only Western land base areas around the Iron Curtain likely ever to have adequate early warning systems and having sufficient territorial depth to prevent this are Western Europe and Alaska. Therefore, there is a case again for having the infrastructure located in rear bases from which flying boats could set out to refuel at advanced anchorages before striking. The philosophy of the P6M ' Sea Master ' seems more viable than that of the B-58 ' Hustler.' The case for having the high-altitude strike force equipped with flying boats is as in Section III, except that the loading of the large conventional bombs required would present serious difficulties.

The purpose of this strategic offensive would be the continual dislocation of Heartland communications, thereby reducing strategic mobility and war production.

VII

The military containment of Communism achieves two related but distinct ends. The most obvious one is that it preserves the territorial integrity of the West and nations friendly to it. The other is that, by depriving militant Communism of the intoxicating experience of continual expansion, it encourages the Communist sense of messianic mission to wane. This is in line with the ultimate objective of foreign policy, and with what we can hope for as economic growth within the Soviet bloc leads to the development of a less puritanical and more liberal outlook. However, such a trend will be slow and erratic, and for many years ahead the possibility of a resurgence of Stalinism will remain.

Nevertheless, it seems that the current relaxation of tension will provide us at least with a breathing space in which to rethink our basic strategic doctrines. From the above examination the writer draws two main conclusions. The first is that the continual provision of a thermonuclear deterrent, that is both potent and invulnerable, will require constant adaptation to technical change, and will become to a greater extent than now a problem in applied sea power. Secondly, assuming the thermonuclear deterrent remains effective, the most dangerous possible form of all-out conflict in the future will become that of several simultaneous local wars. To meet such a challenge adequately, the West will need greater strategic mobility afloat and a greater capacity to assault the Heartland with conventional explosives than it, at present, possesses. However, given the correct equipment (which, admittedly, would take some years to procure) in this form of all-out conflict, as in others, the sea could prove superior to the Heartland both as a surface of communication and as a base for attack.

[97] *The Observer*, 25.10.59.

THE LOSS OF THE RAMILLIES

By G. J. Marcus

IT is possible that even today there are a few elderly persons among us who can recall hearing long ago in their childhood, perhaps sung by some old fisherman or man-of-war's man, one of the many lugubrious ballads which commemorate the loss of His Majesty's ship *Ramillies*, on the south Devon coast, near the Bolt Head, on a dark and stormy evening in February, two centuries ago.[1]

> " Seven hundred and twenty brave men had we,
> With ninety good guns to bear her company.
> But as we were sailing to our sad surprise,
> A most dreadful storm began to arise."

The *Ramillies*, 90, was a famous ship in her day. Launched at Portsmouth in 1749, she had been Admiral Byng's flagship on the occasion of the fateful engagement off Minorca at the beginning of the Seven Years' War, which cost Great Britain her Mediterranean base at Port Mahon and the unfortunate Admiral his life. Sir Edward Hawke had flown his flag in her in the abortive attempt on Rochefort in 1757, in his cruise in the Bay of Biscay in 1758, and in the long and rigorous blockade of Brest in the following year. This last was the decisive campaign of the Seven Years' War which resulted in the surrender of Quebec and assured the future of the English-speaking peoples in North America. The *Ramillies* was an unlucky ship in her later years. She missed the crowning triumph of the campaign, the action of Quiberon Bay, by no more than a few days, for shortly before Hawke's great victory she had become so leaky through the severe westerly gales that autumn that the Admiral had been obliged to shift his flag from her to the *Royal George*. Captain Wittenronge Taylor, his flag-captain, unhappily for himself, did not accompany Hawke to his new flagship but remained in the *Ramillies*, and presently took her round to Plymouth to undergo extensive repairs. It was not until the New Year that she was in fact fit for sea again; and her next voyage was her last.

Appointed in January, 1760, to the command of the Channel Squadron in succession to Hawke, Admiral Edward Boscawen, in his flagship the *Royal William*, accompanied by the *Sandwich*, *Ramillies*, *St. George*, *Princess Amelia*, the *Venus* frigate, and the *Hawke* cutter, sailed from Plymouth Sound on the morning of 6th February to join the main body of the fleet anchored in Quiberon Bay. Boscawen had already made two previous attempts to get down the Channel—on 22nd January and 3rd February—but on each occasion the strong westerly winds had forced him back to port. Now, notwithstanding that the winds were still contrary and the omens by no means favourable, he was impatient to get on his station. On the 10th the wind backed from S.W. to S.S.W., and on the 11th a long, sullen swell came rolling up the Channel; soon after the bad weather came home. On the morning of the 12th the wind freshened at S.W., with hard squalls of rain and sleet and thick weather.

During the next few days the squadron was struck by a succession of heavy gales from S.W. to N.W.—" so violent," Boscawen declared, " that I could seldom carry a topsail." During the night of the 13th/14th they were obliged to lie-to, and once

[1] The following account is based mainly on the Admiralty Papers preserved in the Public Record Office: Admiral Boscawen's dispatches, and Captains' and Masters' journals.

again during the afternoon of the 15th. The squadron had at last cleared the Channel when, in a hard westerly gale on the 14th, the *Royal William* split all her sails, was repeatedly pooped, and had all her lower quarter galleries carried away, besides suffering other severe damage. By this time the flagship had lost company with the *Ramillies* and *St. George*, as well as with the frigate and cutter. In the same gale, while they were engaged in shortening sail on board the *Sandwich*, a number of men fell from her maintopsail-yard and were drowned. The flagship, with the *Sandwich* and *Princess Amelia*, bore away to the eastward, and about half-past ten on the following morning made the land in Mounts Bay. They then wore and stood to the south-eastward and, two hours afterwards, saw breakers away to the northward—presumably the Stag Rocks off the Lizard. The squadron stood out to the 50-fathom line. In the afternoon of the 15th they were struck by another violent sou'-wester. "At half-past four," stated the captain of the *Royal William*, "clewed up all our sails and lay-to under our bare poles." "I think from the hour of two in the afternoon yesterday," wrote Boscawen on the following day, "it blew stronger than I ever felt it in my life, till four, when it lulled by degrees, but it still blows hard at W.S.W."

It would appear that the storm struck the whole Channel coast and the southern counties generally. The *Annual Register* records that in London it blew a hurricane, whereby much damage was done both by land and in the river. The lead was ripped off Lord Cowper's house in Great George Street. The Theatre Royal, Covent Garden, lost most of its chimney-stacks. The Mall in St. James's Park was blocked with branches of trees. Upwards of twenty-seven feet of lead on the roof of the Admiralty was rolled up by the fury of the wind "like a scroll." In the Thames, a large number of vessels were driven from their moorings and collided with one another or were stranded; out in the country the storm stripped the chimneys and tiles off houses, tore up trees by their roots, overturned walls and fences, and swept away corn- and hay-ricks and even cottages.

The *St. George*, having parted company with the flagship in the gale of the 14th and sprung all her masts, "bore away," as her log recorded, "for ye 1st port we could get into." On the following day she was fortunate enough to fall in with the frigate *Venus*, from whom she learned that the Start bore at that time some nine miles to the N.W. Sounding continually, she made the best of her way up Channel and arrived on the 16th at Spithead. About the same time the *Venus* anchored in Portland Road.

Meanwhile, in the small hours of the 16th, the *Royal William* had been obliged by another violent gale to lie-to under a balanced mizen[2] and main, fore, and mizen staysails; at 6 a.m., the wind having moderated, they made sail again and, standing to the northward, sighted the Dodman; at noon they rounded the Rame Head, and early in the afternoon anchored in Plymouth Sound with the *Princess Amelia* (which is said to have been "much shattered"), and were shortly after joined by the *Sandwich*, which had lost her mainyard.

Soon after their arrival they learned that the *Hawke* cutter had been lost with all hands. There was worse to come. The same evening they learned that the *Ramillies* had gone to pieces on the Bolt Tail; and that out of her total complement

[2] "The operation of balancing the mizen is performed by lowering the yard or gaff a little, then rolling up a small portion of the sail at the peak or upper corner, and lashing it about one-fifth down towards the mast." (Smyth, *Sailor's Word Book*, 1867.) This, of course, refers to a Pateen mizen, which was balanced by tying up the outer part of the sail to the yard. Lateen sails are still reefed in this way.

of 734 officers and men only about two dozen had escaped destruction. The news was brought to Boscawen by the only surviving officer of the *Ramillies*, a midshipman named John Harrold; and we may picture Harrold and the old Admiral seated together in the lamp-lit cabin of the *Royal William* while the youngster delivered himself of the " melancholy account," which was later forwarded to the Admiralty, of one of the most tragic disasters in the annals of the Royal Navy.

On the evening of the 14th, as has already been explained, the *Ramillies* had parted company with the flagship. The former was discovered to be making a good deal of water as the result of a serious leak. The hands were employed at all the pumps and at baling with buckets as well. The captain had ordered guns and signal-lights to be got ready for making the signal of distress; but presently they bore away without making any signal, steering all that night to the eastward.

Next morning found the officers gazing with anxious concern across a waste of heaving, foam-capped waters at the blurred and contracted horizon, with next to no idea of their position and the dread of a lee shore uppermost in their thoughts, running blind on dead reckoning. About ten o'clock, still standing to the eastward, some of them thought they saw the land; but in the thick south-westerly weather there could be no certainty; and the master (the equivalent of the navigating officer of today) was of a contrary opinion. The *Ramillies* then stood in to make the land and about an hour later her look-outs suddenly sighted the coastline (actually it was Bigbury Bay); but the master, mistaking Borough Island for Looe Island, concluded that they were still to the westward of Plymouth.

The crowds which had quickly collected on the neighbouring heights of Bolt Head at the rumour of a vessel in difficulties saw the *Ramillies* labouring in a terrific sea—alternately lifted high on the crest of a swell, then buried deep in the trough of the surges. Observing that the vessel lay somewhat to the northward of Bolt Tail, the onlookers anticipated that she would bring up in Bigbury Bay rather than attempt to get round the Bolt with the great swell setting right in on the land. To their surprise and concern, however, they presently saw her wear and set her courses and topsails. From that moment the *Ramillies* was doomed.

Crowding all the canvas which the ship would carry, the crew of the *Ramillies* endeavoured in vain to double the high rocky promontory of the Bolt which, owing to the master's error, they had taken for Rame Head at the entrance to Plymouth Sound. To quote one of the old ballads mentioned earlier:—

> " Under close reefed topsails so neatly spread
> Thinking to weather the old Rame Head."

Though the captain as well as some of the other officers had been of opinion that they would not be able to weather the headland, the master was firmly persuaded that they could. Directly he realized his mistake he endeavoured to stay the ship and get into Bigbury Bay: but the heavy westerly swell, added to the dead weight of water lying in her hold, made it impossible. It was now too late to wear. To leeward, beyond the seething line of the surf, loomed a succession of dark, rugged cliffs rising abruptly to a height of 400 feet, backed by a wilderness of barren, heathery moorland. No anchoring ground here; no possible place of refuge. The master in fact could not have steered the *Ramillies* into a worse situation.

About this time two of the crew, named Wise and Roebuck, were standing by the main-sheet. They heard someone cry out that the mainmast was sprung: and then a shout from the captain, " Let go the main-sheet! " The men obeyed; and

immediately ran up on deck, where they found the mainmast gone and presently the mizenmast. Wise then heard the master call, " Let go the anchor and clew up forward," which was done. The people next let go another anchor and cut away the foremast, which carried the bowsprit with it.

What had happened was this. The ship being now in the most imminent danger, the master had ordered the best bower anchor to be let go. Then, seeing that it hung and they were only about half a cable's length from the rocks, her people had hurriedly cut loose the small bower from the bows. Both cables ran out together and the ship brought up. Though they lay close in with the Bolt, the weather was so thick that even yet they did not know the land. In this extremity the *Ramillies* rode till the dusk of the short winter's day. But the two cables had crossed; and finally the violent and long-continued friction caused them to part. It was then getting on for six o'clock. As the ship drove they let go the sheet anchor. But before they could give her cable to bring her up, she suddenly struck with her starboard quarter; whereupon her bow swung round to the westward and took the rocks. In the ensuing moments mountainous seas swept over the stricken vessel, carrying all before them.

The final scene was one of indescribable confusion, horror, and despair. Shortly before the *Ramillies* broke to pieces, the captain of marines went off his head and marched up and down the poop singing and declaiming, while the boatswain, who had brought his small son to sea with him, endeavoured in vain to save the child's life by flinging him towards the shore. Midshipman Harrold, with eight of the men, clambered down the stern and scrambled on to the rocks. Some 17 others also managed to get ashore. The last man to reach safety appears to have been William Wise, who got down the starboard stern ladder and flung himself on to the rocks. Wise afterwards related that, on looking back, he could see no sign of the wreck. All that remained of her above water must have been smashed to matchwood. More than 700 men perished amid the breakers at the foot of the cliffs or were battered to pieces among the rocks. Presently the few survivors were hauled up the face of the cliff by the crowds of people assembled on the slopes above.

Young William Locker, until lately a lieutenant in the frigate *Sapphire*, had just been appointed to a lieutenancy in the *Ramillies*. He arrived in Plymouth only a few hours before her departure with the rest of the squadron, but was not allowed to go aboard her as his commission had not yet been received from the Admiralty. Shortly after the disaster Locker, who had been on terms of close friendship with one of the lieutenants of the *Ramillies*, travelled to the scene of the wreck to endeavour to discover his body. He found Bigbury Bay strewn with hundreds of floating corpses, but " the sea had rent away almost every part of their clothing," and their features were so battered and disfigured that identification was impossible.

The stern of the *Ramillies* was jammed into a cave to the eastward of Bolt Tail ; one of her cables was lying over a rock, but her bow and what was left of her hull were entirely submerged. " I can't see any part of her mast, sails, or yards," wrote the master attendant from Plymouth Dock, who had arrived on the 17th on the scene of the wreck, to Admiral Boscawen, " and I think the sea has split and tore them to pieces without they lay in coves that I can't see without a boat."

About the same time a letter reached Boscawen from the two Customs officers stationed in the nearby village of Hope, who had been keeping a watchful eye on the wreckage " in order to prevent the Country People plundering his Majesty's stores." For some time after the weather had moderated little could be done: but as soon as the sea went down these officers occupied themselves with the work of salvage.

" This day in conjunction with Mr. Hall [the master attendant from Plymouth] we have agreed to hire eight men," they informed the Admiral, " to bring the iron worke and what else may be found up the steep cliffs, being in our opinion the only expedient that is practicable . . . we shall do every thing in our power that may be conducive to his Majesty's service. . . ."

To sum up: the disaster of 15th February, 1760, serves to underline the fact that most of the casualties suffered by the Navy in the days of sail must be attributed to the dangers of the sea and not to the enemy. Hence the fundamental importance of seamanship as a factor affecting both strategy and tactics. The loss of the *Ramillies* was actually due to bad seamanship rather than bad weather. After all, the four other three-deckers—the *Royal William*, *Sandwich*, *St. George*, and *Princess Amelia*—had run much the same risks and had got back to port. Their logs, which may still be read, give testimony of the cautious navigation and good seamanship which brought them safely through those February gales of two centuries ago.

The loss of the *Ramillies* is in fact to be attributed to the three successive errors of judgment on the part of the master. The first of these occasions was on the morning of the 16th when the officer, unconvinced that they were already near the land, had stood in to make it. If they had only continued on their course they should have had no difficulty in weathering the Bolt and might well have got safely into Torbay. Later on, the master had taken Borough Island, which lies in the depth of Bigbury Bay, for Looe Island, which is on the further side of Plymouth. All possible allowance ought to be made for the fact that the weather in this part of the Channel on the afternoon of Friday, 15th February, was, in the expressive phrase of old West Country fishing skippers, " thick enough to deceive even the elect." Moreover, the high, rounded lump of Borough Island is strikingly similar to Looe Island in outline, and the soundings to the southward are also deceptively alike. On the other hand, should not the very similarity of the two islands and the soundings have put the master on his guard? What is still harder to understand is how they could have mistaken the Bolt for Rame Head, seeing that the distance between Looe Island and Rame Head is nearly three times as great as that between Borough Island and the Bolt. Thirdly, the master had made the final and fatal error of supposing they could weather the headland. Now a square-rigged vessel cannot possibly sail so close to the wind in heavy weather as she can in smooth water; moreover, when obliged to take in sail she makes increased leeway in proportion to the reduction in sail area. Considering the conditions of wind and sea on this particular afternoon, it is doubtful whether even a frigate could have got round the Bolt. For a heavy three-decked battleship, with reduced canvas and already half water-logged, it was a desperate venture. Not once, or twice, but three times over the master's seamanship had been grievously at fault. And three times is too many.

Such was the untimely fate of the famous vessel which for so many months had carried Hawke's flag in one of the greatest and most crucial campaigns of our naval history, the Year of Victories, the " Great Fifty-nine."

THE EFFECT OF THE CARDWELL REFORMS IN ARMY ORGANIZATION, 1874–1904

By Brian Bond

THE reforming measures of Edward Cardwell, Secretary of State for War, 1868–74, are best seen as a belated response to the glaring deficiencies in the organization of the British Army as revealed by the Crimean War. Indeed, Cardwell's ministry is in some ways the culmination rather than the initiation of a period of military reform. Palmerston, for example, took the first step towards clarifying political responsibility for the Army when in February, 1855, he combined the offices of Secretary at War and Secretary of State for War. A clearing was also made at last in the tangled undergrowth of the departments responsible for feeding, clothing, and arming the soldier; notably by Sidney Herbert. Most important of all, the lessons of the Crimean War, reinforced by the growth of large armies on the continent, convinced all but reactionaries and pacifists that Britain was gravely endangered by her total lack of a reserve force. The Volunteer Force was consequently revived in 1859, and after several comprehensive Committees of Enquiry, General Peel established in 1867 a Militia Reserve of 3,000 trained soldiers to supplement the Regular Army in case of emergency. Thus when Cardwell took office, military reforms, especially the creation of a Reserve, were already in progress, and it is significant that even the commercially minded and pacifically inclined Cobdenite wing of the Liberal Party, including Gladstone and Bright, favoured military reforms, though their primary concern was financial economy rather than the creation of an efficient army.

The size of the British Regular Army had diminished steadily through the 1860s as a result of the usual demands for financial retrenchment after a war, until in 1870 it reached the lowest figure since the end of the Crimean War of 170,817 rank and file.[1] The infantry, by far the largest and most important arm, comprised 141 battalions; more than half of them stationed in India or the colonies. All but the first 25 battalions were independent units, or regiments, depending on four detached depot companies in Britain for drafts of fresh men. The principal duty of the Regular Army was to act as a colonial police force, just as it had in Wellington's time. Secondly it was required, with the assistance of the Militia and the newly reconstituted Volunteers, to deal with civil emergencies at home and to resist invasion. This dual role strained the small, long-service Army to breaking point.

In these circumstances few politicians or soldiers were optimistic enough, in the 1860s, to contemplate war on the continent. Palmerston's bluff on the Prussian invasion of Denmark in 1864 had been called, revealing our complete lack of an expeditionary force. Belligerent Tories therefore contented themselves with punitive expeditions against uncivilized countries like Abyssinia, while the Liberals renounced force entirely in favour of commerce and domestic reforms.

The two Acts of Parliament on which this article is based are the Army Enlistment Act of 1870, replacing 12 years' long service by six years with the Colours and six in the Reserves; and the Localization Act of 1873, by which all the infantry battalions were affiliated in pairs, and localized for the purposes of recruiting and training, in brigade areas, of which there were originally 70. The essential part of this scheme was that normally in each double-battalion regiment, one battalion

[1] *General Annual Returns of the British Army*, 1872, p. 8.

should be abroad and one at home. The latter would supply the former with drafts of trained men until it relieved its sister battalion overseas. The Militia and auxiliaries were included in the localization scheme in that together with the two line battalions they comprised the ' brigade,' and were attached to the same headquarters, called the ' brigade depot.'

The most important advantage to be derived from short service and localization was a trained Reserve for the Regular Army, which Cardwell in 1870 restricted, ironically as it turned out, to 60,000 men.[2] In view of what was soon to happen, it must be stressed that originally the Reserve was intended to be called out only in times of national emergency, such as an invasion. Small colonial wars, from which the Empire was seldom entirely free, would be fought, as they always had been, by garrisons on the spot, reinforced if necessary by small expeditionary forces from England. The 18 battalions next due for foreign service were to be kept on a high war establishment of 820 rank and file, specially to meet such minor crises. My contention is that Cardwell's organizational reforms, though well-intentioned, contained certain flaws at their launching and in practice simply did not work, so that the charges brought during the Crimean War (e.g. that there was no Reserve and virtually no home defence), were still true in 1904 after the South African War.

The first report on the working of the new system came in 1876 from the Militia and Brigade Depot Committee under Mr. Stanley's chairmanship. Its members (notably Major-General Wolseley) were all known to be in favour of the short service and brigade depot system and there was no question at this stage of abandoning either. Nevertheless this report was disquieting. In four years only 40 out of 70 depots had been formed; officers had not been freely transferred within the affiliated battalions, and already there were cases of depots failing to provide enough replacements for their two line battalions.[3] Naturally the annual turnover of men under short service was much higher than under long service, so recruiting would have to increase. Already, in 1876, recruiting figures were causing anxiety. General MacDougall, who had been chairman of the original Localization Committee and remained the keenest supporter of brigade depots, said in his evidence[4] that as yet only one brigade depot had been fully constituted with its two militia battalions (the Buffs at Canterbury), and that this had been quite unable, owing to the large number of youthful recruits, to send a battalion on foreign service without asking for 200 volunteers from other regiments. Elsewhere he stated[5] that short service had put greater strain on the brigade depots than they were originally intended to bear. This was a surprising admission considering that the only extra strain to which the new system had been subjected so far was the Ashanti War of 1873–4. Concluding that localization in its present form had so far been a failure, Stanley's Committee made the remarkable recommendation that affiliated battalions should be fused into territorial regiments. Their reasons were weak; the main one being that as so much money had already been spent on brigade depots it would be a pity to scrap them.

The most important Committee of the period, both for its distinguished personnel and forthright opinions, was that presided over by the Adjutant-General, Lord Airey, in 1878–9 on Army Reorganization. Under the terms of reference

[2] Army Enlistment Act, 1870, para. 9.
[3] See Report, paras. 4 and 35.
[4] Minutes of Evidence, 6313–5.
[5] Ibid, 6376–9.

given by the Secretary for War, Stanley, it was bound to accept the main features of the prevailing system. The Committee announced that there was complete agreement on the defects of the present system, the main ones being:—

(1) The demand for men was too great to allow recruits to be properly trained at the depots, which in any case were inadequate in size and facilities.

(2) The result was that the home battalions were robbed of their best men, especially of potential non-commissioned officers.

(3) That changing men to different units was ruining *esprit de corps*.

The Duke of Cambridge, who it must be remembered had drawn up the original memorandum on short service for Cardwell, said in evidence; "I always said that short service must be tentative; it was the only way to get a Reserve, but it seems that the present system has failed because of our peculiar military needs. We have entirely sacrificed the Army to the Reserve."[6] He thought that the strain on the new system had been exceptional in 1878–9 because we had been fighting simultaneously in Afghanistan and South Africa; then went on with characteristic logic to admit that similar crises occur frequently and ought to have been taken into account when the new system was set up. In spite of their restricted terms of reference the report on brigade depots amounted to a condemnation—they had proved inadequate for recruiting and training and could best be used, as some compensation for their expense, as stores and headquarters for the Militia.

Criticism of army organization will rightly be regarded as so much hot air unless its weaknesses are made apparent in war. The small campaigns from 1877-82 against the Zulus, Afghans, Boers, and Arabs were sufficient to stop the delicate machinery which had been creaking ominously in peacetime. Briefly what happened was that the home battalions had become mere training units for those abroad and were more than half full of youths and other ineffectives who could not be sent on active service. There had always been more battalions abroad than at home, and consequently by 1878 there was not one home battalion ready for active service. The Egyptian campaign of 1882 shows what tended to happen on the declaration of war. To scrape together a force of 20,000 men, 10,800 Reservists, strictly unavailable for small wars, had to be called out, and even then battalions were brought up to strength only by the old deplorable method of getting volunteers from other units.

Britain's military weakness was well known on the Continent. The Russian General Staff Journal for 1882, commented; "The difficulty the Government experienced in raising attenuated regiments to their proper strength, and the numerous cases that occurred of mere skeletons of detachments being sent to the seat of war, showed that, at the very utmost, England could not land more than 40,000 troops on the Continent of Europe without considerable difficulty, and even this could not be effected without leaving England completely bare of an army."[7]

Childers, a reformer after Cardwell's own stamp, an extremely efficient minister and civil servant with no practical knowledge of the Army, rejected the emphatic recommendations of the Committee of 1879, which incidentally he kept secret from Parliament until the spring of 1881, in favour of those made in 1876. After a prolonged process of softening up public opinion with the aid of *The Times*, he

[6] Ibid. Minutes of Evidence, 3392 ff.

[7] *The Weakness of the Army*. Miscellaneous Essays, Vol. VII, p. 530. War Office Library.

created the territorial system proper in 1881. It is difficult to know whose authority to accept for the military situation in the 1880s. While Childers was informing his constituents that recruiting was satisfactory, Wolseley, the Adjutant-General, admitted in public that he foresaw a recruiting crisis.

In the 1880s the Liberal policy of splendid isolation from Europe, deriving from Cobden and the Manchester School, had its heyday. After the dominating problem of Ireland, Egypt and the Sudan were at the centre of political controversy. The decision to leave a garrison in Egypt after the Gordon catastrophe meant that there were now 11 more battalions abroad than at home. Campbell-Bannerman, the Secretary for War in 1886, wrote to Harcourt, then Chancellor of the Exchequer; " If the Egyptian garrison is to be maintained continuously, depots must be created at home to supply drafts. It completely vitiates our organization and causes great indirect expense."[8]

In 1892 was published the report of the Wantage Committee on Terms and Conditions of Service in the Army. By this time short service in some form and double-battalion regiments, for better or worse, had come to stay, and the immediate problems impending were recruiting and maintaining the flow of drafts to India. The crisis in the years 1887–92 was the long-term result of false economy in the mid-1880s when battalion establishments had been temporarily reduced. The military radical Wolseley agreed with the ultra-conservative Duke of Cambridge that not one home battalion was fit for active service in an emergency. The former, in a vivid phrase, likened the home battalions to ' squeezed lemons.'

Rumours of wars reverberated through the 1890s, and as Britain drifted perilously through successive diplomatic crises with Russia, the U.S.A., France, the Transvaal, and Germany, the state of the armed forces, especially the Navy, was suddenly dragged to the front of the political stage, as had happened in 1870. Gladstone resigned the Premiership in protest against increased naval expenditure, and in the following year Brodrick turned out Rosebery's Government on a motion of censure regarding cordite supplies for the Army. Lack of money remained an insuperable barrier to such necessary changes as the formation of new battalions and raising the soldier's pay to a level attractive by civilian standards. Dunlop writes of the 1890s that " as far as the infantry were concerned the Cardwell system had already broken down," and that the effect of the uneven distribution of battalions was " to reduce the infantry at home to a point at which it has ceased to be sufficient, either for the purpose of supporting battalions abroad or providing a force adequate for home defence."[9]

The final witness for the prosecution is the massive report of the Royal Commission on the South African War (also known as the Elgin Report), presented in 1904. Except for the obvious differences in climate and the nature of the opposition, this catalogue of failures and omissions might easily be a belated account of the Crimean War. The Secretary for War, Lansdowne, admitted almost nonchalantly that " no plan of campaign had ever existed." Over 400,000 men were mobilized (a great achievement in itself) to defeat the Boer farmers whose total manpower was at the highest estimate 70,000 and whose army in the field never exceeded 45,000. Within a few months our Reserve was exhausted and not even the cream of the Militia and Volunteers remained for home defence.

[8] *Sir Henry Campbell-Bannerman*, by J. A. Spender, Vol. I, p. 101.

[9] *The Development of the British Army*, 1899–1914, J. K. Dunlop, p. 39. (Methuen, 1938.)

Thus, after 30 years of confusing changes accompanied by continual criticism, notably from the Committees of Lords Airey, Wantage, and Elgin, the expeditionary Army and home defence force in the Boer War had still to be hastily improvised. Indeed, after the Royal Commission's gloomy report, the Commander-in-Chief, Lord Roberts, and the Adjutant-General, Sir Kelly-Kenny, both felt that some form of conscription was essential if Britain wanted an army that would not disgrace her if called upon to fight a continental enemy.

By 1880, as Lord Airey's Committee showed by a mass of detailed evidence on recruiting figures and the performance of short-service men on colonial campaigns, short service, at least under the original terms, had failed. Giving prior consideration to Indian service, the Committee recommended altering the terms of enlistment to six months' training, eight years with the Colours, and six in the Reserves (i.e. 14½ years in all)—a retrogressive step towards long service which Childers implemented to some extent. Several members of the Committee thought this suggestion too radical because they were still pursuing the mirage of a large Reserve which had so far failed to materialize. General Sir Lintorn Simmons thought that the present system must be broken in the other (i.e. the Prussian) direction by adopting three years with the Colours and nine in the Reserves, and making the Army so attractive that sufficient men would volunteer for life service. After Childers's alteration, Hartington further confused the issue by allowing any private or non-commissioned officer to sign on; an indication that recruiting had failed and that the Reserve was being temporarily sacrificed. One thing at least is clear; continual changes in length and conditions of service had a bad effect on recruiting, and what was more important in the long run, discouraged potential non-commissioned officers from signing on.

The principles on which localization was adopted in 1873 seemed admirable. The nominal connection of regiments with counties, dating from 1782, would at last be realized. As in Prussia, the territorial unit (in the brigade area) would be self-sufficing; recruiting from its own area, each of which was carefully carved out according to the density of population, and training its recruits at the depot. The affiliated Militia and Volunteer battalions would profit from contact with the Regulars during their annual training. Finally the Reserve, too, would be localized, and in an emergency would swell the ranks of its old regiment. Recruiting would be more thorough, and local loyalty might have such practical benefits as causing more men to volunteer from the Militia into the Line. This carefully calculated scheme had disappointing results. It failed to take account of a simple fact, well known to recruiting agents, that the great majority of recruits came from the industrial north, whereas most of the great barracks, such as Colchester and Parkhurst, were in the south of England. Consequently, with a few exceptions, regiments continued to be as nondescript in their composition as ever, and only on rare occasions was a home battalion lodged in the district whose name it carried.

The Committee on Reorganization in 1879 reported that the brigade depot system had not fulfilled expectations, even in combing every corner of the country, and noted; " they are at best very dull places for recruits, where they have only a few non-commissioned officers and grumbling old soldiers to mix with; owing to their smallness they afford the worst training possible for young officers, and on account of the impossibility of getting any battalion drill, both officers and non-commissioned officers deteriorate."[10] The Committee recommended, with a minority

[10] Report of Committee on Army Reorganization, 1879, paras. 181–190.

dissenting, that several brigades should form a common training depot (like the Guards at Caterham), and that recruits, unless they expressed a special preference, should be available, when trained, for any battalion. Had this course been adopted it would gradually have lessened obstinate regimental independence more tactfully than the blunt method of linking employed by Childers.

Cardwell had left the linking of battalions at the half-way stage, but if anyone is to blame it is the Duke of Cambridge, who in his memorandum for Cardwell used ambiguous phrases to the effect that " the regiments linked are to be continued as separate corps for the officers, and made to act as much as possible in mutual support," and later, " the battalion at home *may* serve as a feeder for the supply of casualties to the battalion abroad." In fact, until 1881 affiliated battalions kept their own numbers, traditions, uniforms, and honours, and men transferred from one to another only with the greatest reluctance. The Duke cited an example from the Ashanti War in which the 79th lent over 100 volunteers to the 42nd. The men went readily enough but as soon as the campaign ended demanded that they be returned to their own regiment.

The system of linked battalions never worked. When the scheme began in 1872 there were 70 battalions at home and 71 abroad. The Ashanti War soon tipped the balance to 69–72, and by 1879 it was tilted hopelessly at 59 to 82. There is not much to be said for a system which collapses under such slight and predictable strain. Lord Airey's Committee found that the arrangements made in 1872 were quite useless for the small wars that actually occurred.[11]

If there is any one criterion of the success or failure of the Cardwell system it is the creation of a Reserve. In 1869 there were only about 3,000 long-service reserves and a Militia Reserve of 30,000 created two years previously by General Peel; whereas when the South African War began in 1899 the Regular Army Reserve stood at about 80,000, nearly all of whom responded to the call to arms. Gradually during this period there was a subtle change of opinion as to the purpose of the Reserve, and this, I believe, concealed, at least until the outbreak of war, that in practice the formation of a Reserve had been a costly failure, both as regards money and efficiency. Originally it was meant to be a Reserve for the Regular Army; that is, to bring the battalions up to war establishment and to provide replacements *after* the war had begun. Like the Militia, it was to be called out only in emergencies; otherwise the Reservists' pay of 6d. a day was callously low. When 10,800 Reservists were mobilized for the Egyptian campaign of 1882, critics howled at the supposed illegality, while supporters of Cardwell, including *The Times*, pointed to the campaign as a triumph for the short-service system.

By the time the Wantage Committee reported in 1892 it was generally admitted that not a single home battalion was fit for active service without the substitution of at least 200 Reservists. Sir Arthur Haliburton spoke for a large school of believers in the principle that ' what is, is right ' when he argued in his dissenting memorandum that the purpose of the Reserve was to make good the losses in the home battalions *on the declaration* of war. Sir Frederick Roberts expressed the opposing view as follows: " Under the present system we are paying twice over for the same article, for we maintain a Regular force, a portion of which could take no part in active operations, except perhaps for home defence, and we maintain a Reserve which

[11] Ibid. para. 16.

instead of being an addition to the home Army would be expended in bringing that Army up to its normal strength of efficient soldiers."[12]

Roberts's apprehensions were fully justified by the Boer War, in which, as Arnold-Forster put it; "The whole Army having been mobilized, 80,000 men of the 1st Class Army Reserve took the places of 100,000 incompetent soldiers; in other words we had returned to the precise position which the country occupied in the Crimean War, where we had a first line of undoubted excellence and behind it nothing but a crowd of unorganized and incompetent recruits."[13]

At the root of all the criticisms of army organization in these years is the problem of recruiting. Had sufficient fit and mature men volunteered, the home battalions would not have deteriorated and the linked battalion system would have worked. Recruiting figures for the years 1860–1900, which rose steadily if slowly from 19,453 in the best year of the 1860s (1867) to 41,659 in the best year of the 1890s (1892), belie the true state of affairs. Two related factors conspired to render them useless as criteria of the state of the Army, namely, wastage and the quality of the recruits obtained. General Sir Lintorn Simmons, a member of Lord Airey's Committee, summarized its findings on wastage of men in the article mentioned above. He showed that of any 1,000 recruits, 123 would be lost to the Service within one year, a further 246 within two years, and another 290 within three. Thus in the infantry alone, less than one-quarter of the recruits completed three years' service, and losses from the other arms were greater, possibly because their training was more arduous. The main categories of wastage were desertion, death, imprisonment, and purchase of discharge. For example, in 1881, 3,436 men paid over £50,000 for their discharge. The effect of these losses, together with the operation of short service, can be clearly seen in the increasing number of men sent home from India. While the Indian establishment remained at 56,000 men, annual replacements rose from 5,608 in 1871 to 8,596 only seven years later.

Greatly influencing the amount of wastage was the quality of troops as regards age and medical fitness. Bearing in mind Lord Raglan's words about young recruits in the Crimea, Lord Airey's Committee went to great trouble to investigate the sickness and deaths in the South African and Afghan campaigns in the late 1870s, and the evidence left no doubt that men under 20 were generally unfit to stand the rigours of active service, even though the climate in South Africa was considerably easier for soldiers than Europe. Childers accepted their findings, and after 1881 no recruit under 20 was to be sent on active service, a fact which goes far to explain the large number of ineffectives thereafter to be found in the home battalions. Unfortunately most recruits were considerably under 20, and if they were rejected, home battalions would have fallen hopelessly below establishment. Throughout the period the War Office used the pernicious expedient of altering the minimum physical requirements, and turned a blind eye to age limits according to the industrial situation, which largely determined the flow of men. Once again it was Roberts, who disputed Haliburton's claim that recruiting was in a healthy state compared with long-service days, by calling attention to the declining physical standard.[14] Under the old régime, and still applying in 1870, 5 ft. 8 in. had been the standard height. By 1873 it had fallen to 5 ft. 4½ in., and after being altered at least once every year, fell to

[12] *National Prosperity and its effects on the Army*, p. 27 (W.O.A244).

[13] *The War Office, the Army, and the Empire*, H. O. Arnold-Forster, p. 34 (1900).

[14] Roberts is quoted by S. Childers in *The Life of the Rt. Hon. Hugh C. E. Childers*, Vol. II, p. 83, footnote (1901).

5 ft. 4 in. in 1881. In the middle of the Boer War the minimum was set at 5 ft. which virtually signified abandonment of checks on physical fitness.

The following questions on recruiting naturally arise:—

1. Did the increase in recruits from 1870 cover the increased demand due to short service and wastage?
2. Was the creation of a Reserve of 67,000 men in 20 years sufficient compensation for the disablement of the home battalions?
3. Assuming that our Army could still beat savages, had it improved since 1870 relative to European armies?
4. Granted that recruiting was difficult in the days of long service, had the Army adapted itself to draw on the rapidly increasing population? From 1861–91 the population of Britain increased by 9,901,000 from approximately 23 to 33 million; whereas in the same period recruiting increased by only 25,000 from 10,918 to 36,000.

It seems to me a fair conclusion that owing to the unexpectedly large demands of short service and the failure of volunteer recruiting to provide enough mature recruits, quality was sacrificed to quantity, and even then establishments were not kept up.

The social status of the Army should throw light on the recruiting problems. After 1870 brutal punishments were certainly modified, but the Queen's uniform was still socially degrading. For instance, soldiers were banned from certain public amusements. Colonel William Mure, M.P., who made a special study of the civil employment of ex-soldiers, told Lord Airey's Committee that a prison warder he had interviewed told him that in advising released prisoners, he said to incorrigible criminals; "Join the Army."[15] Desertion, particularly from the Militia, could be a profitable pastime, for with so many recruiting centres it was impossible to trace delinquents.

John Holms, M.P., an authority on terms of employment, drew the attention of Lord Airey's Committee to the fact that the lowest pay in the Army, the infantry private's 13s. 5¾d. per week, compared badly with railway porters, whose lowest was 15s. Moreover, the soldier's meagre pay was liable until the mid-1890s to various stoppages for food, clothing, transport, and barrack damages, which could leave him with almost nothing. Barracks were often bleak and insanitary. Aldershot was then a slum of wooden shacks, and there were no married quarters.

Civil employment of ex-soldiers, and especially of Reservists, was another neglected subject which did much to discredit the Army. Childers strongly recommended that the War Office should reserve certain posts for such men, but after 10 years nothing had been done. It was suggested that a special War Office department should be set up to deal with the problem of discharged soldiers. Haliburton successfully opposed this on the grounds that it would discourage certain charity organizations. Colonel Chenevix Trench, in a powerful article called "The Dark Side of Short Service,"[16] proved that in 1887 at least, many Reservists had found it impossible to get employment because in recent years they had been mobilized several times and were therefore the first unskilled labourers to suffer during a slump. Fortescue also recalls that "when the first batch of Reservists was turned loose

[15] Minutes of Evidence, 2608.
[16] Reprinted in *Miscellaneous Essays*, Vol. 38 (War Office Library).

upon the country they were not well-received. The present writer can well remember swarms of them begging in the streets of London."[17] The public remained mildly censorious or apathetic to the Army except in periods of crisis, such as Gordon's encirclement, or of celebration, like the Queen's Jubilee, when they were praised in the Kipling manner.

I have not given the Militia and Volunteers much space because, in spite of their large numbers, their lack of training, equipment, and above all means of mobilization, made them in practice almost useless. The Militia would have been valuable in the event of an invasion but was not available for minor wars, and in major ones could only be employed outside Britain on garrison duty if the whole regiment volunteered. The Militiamen, who had 56 days' initial drill, then 28 days per year training for three or four years, could not be considered a trained soldier. Probably the auxiliary forces were of little use in the post-Crimea era owing to their inability to keep abreast of new weapons and training, but no responsible politician would jeopardize his career by demanding the abolition of the old 'constitutional force,' one of the last preserves of the aristocracy.

If this is a fair chronicle of what was wrong with the Army, it only remains to look for causes. In the first place the Army suffered from the national attitude, faithfully reflected in Parliament, that the Empire should be run on a shoestring. This is apparent in the clamour that arose at the conclusion of every campaign to reduce the annual Estimates. Campbell-Bannerman tersely defined his task at the War Office as "to avoid heroics and keep the Estimates down." The British Army was not a popular institution in the way that Prussia's was. Apart from that of Irish Secretary, the War Office was the least coveted seat in the Government. It was regarded as a mere stepping-stone to higher office and changed hands frequently. Childers's biographer says the War Office was the Cabinet post he wanted least.[18] Lord Granville wrote to Gladstone of Hartington at the War Office; "If he is not convinced as to his public duty there is no other temptation for him. He dislikes office, still more his present office, and above all dreads the brilliant success which sometime will fall to him."[19] W. H. Smith was "not particularly interested"; Stanhope went there from the Colonial Office, much against his wish, and proceeded to work himself to death, as Arnold-Forster did later. Campbell-Bannerman went to the War Office in 1886 only because the Queen refused Childers and insisted on him.

Secondly, this picture will be grossly distorted if we ignore the sea of troubles against which even the lustiest swimmer, like Cardwell, could barely hold his own; namely, the cliques and pressure groups which seem to be a permanent scourge on army administrators. For instance, there was the pacifist and commercial side of Liberal foreign policy which manifested itself in a kind of civil war between the Treasury and the War Office. In addition there was the Crown (personified by the 'bow and arrow General,' as Wolseley called the Duke) still trying to assert its ancient prerogative powers over the Army and wearing out the Secretaries of State over petty details concerning the Guards, or a parade.

Famous soldiers also stirred the muddy waters of army administration; in particular, Roberts and Wolseley acquired rival 'rings' of disciples who denounced the policies of the other side and vied with them for influential staff posts. Finally,

[17] J. W. Fortescue, *The Empire and the Army*, p. 275.

[18] *Life and Correspondence of the Rt. Hon. Hugh C. E. Childers*, by S. Childers, 2 vols. See especially Vol. I, ch. IX.

[19] *Life of the Duke of Devonshire* (1833–1908), by B. Holland, Vol. I, p. 398 (1911).

the Army as a professional body objected, and often with good reason, to politicians who, ignorant of Army life, sought to sweep away anomalies without considering tradition and sentiment. Childers's attempt in 1881 to introduce a new pattern of tartan for some Highland Regiments, " specially made for the purpose in Pimlico," was a case in point.

Allowing for the difficulties of the War Office already mentioned, it does seem that the chaotic organization which I have tried to describe was partly due to the failure of any Secretary for War, after Cardwell and before Arnold-Forster, to think out precisely what the Army was for, and to draw up an appropriate scheme for its organization. The simple facts were that England needed two armies, a long-service army to police the Empire and a short-service one to build a Reserve. To get a long-service army required either conscription or attractive conditions by industrial standards. If short service was to fulfil its purpose in forming a Reserve, it had to be really short, and the Reserve was merely an " expensive sham " (as Wolseley called it), unless it was properly trained and really a Reserve for the Line in war. Recruits had to be mature men; filling up the books with ineffectives had the gravest effects on morale and only delayed the day of reckoning.

Finally there is the influence of the Cardwell myth. Cardwell, whose initiative and perseverance no one would dispute, put on the statute books a great number of reforms, many of which, such as the abolition of purchase, had wholly beneficial results. The passionate feelings which his reforms aroused, and the notorious conservatism of his rival, the Duke of Cambridge, with whom he is sharply contrasted, seem to have obscured the fact that some of his schemes were ill-conceived and did not work. Also he left behind a band of devoted admirers, such as General MacDougall, Sir J. Adye, Childers, Campbell-Bannerman, and Haliburton, who between them, with the assistance of *The Times*, created the legend that his reforms were sacrosanct, even though in some cases they tinkered with them. Biographers of successive Secretaries of State repeat monotonously that their ' man ' completed Cardwell's work, without stopping to consider whether in fact it was ever completed, until we get Biddulph's hagiography implying that a revolution in military organization had been effected by 1874 or, at the latest, 1881.

But, it may be said, Cardwell's reforms were perfectly sound in principle and failed only because they were not given a fair chance. This will hardly do, remembering that Cardwell did not make allowances for small wars, nor did he anticipate the recruiting difficulties that accompanied short service. Finally, he did not suspect that affiliating battalions would have any ill effect on those at home. These omissions are attributable to his lack of first-hand knowledge of the Army, and to the most unfavourable conditions under which he laboured, ceaselessly harried from all sides. In any case, the extent of Cardwell's personal responsibility is a mere debating point, whereas the continuing inefficiency of army organization in the period 1874–1904 most certainly is not.

TEXAS, BUENA VISTA, AND THE MEXICAN WAR

By David Rees

IN a year that gives promise of the most exciting U.S. presidential election for some time, it may be worth recalling the campaign and the results of the 1844 election, described at the time as the most fraudulent in United States history. The campaign is best remembered in Britain for the rousing slogan of the Democrats calling for the cession of Oregon—' Fifty-four Forty or Fight.' After all, the Oregon Territory was an Anglo-American condominium, with the basis of the American claim resting on the adventures of Lewis and Clark in the North-west during 1805. This plank of the Democratic platform was peacefully (but only partly) carried out in 1846 when the 49th parallel was extended to the Puget Sound. Much more important was the other official Democratic territorial demand which called for the re-annexation of Texas, and which inevitably led to war with Mexico.

The claim to Texas was an old one dating back to Jefferson's Louisiana Purchase of 1803, and only formally relinquished by President Monroe's Florida Treaty with Spain in 1819. In the late 1820s and 1830s, many American families from the South had crossed the northern boundary of Mexico—the Red and the Sabine rivers—and settled in the province of Texas. There was great friction between the energetic settlers and the moribund administration of the Mexican Republic. Fighting broke out and by 1836 many ' new ' Texans had died for their independence at the Alamo, and others had successfully won it on the field of San Jacinto. The Lone Star Republic, with its capital and Congress at Austin, named after one of the chief settler leaders, was recognized by France, Britain, and the United States, which of course the Texans wished to enter.

The Texans were naturally supported by the Southerners, who saw a new state of Texas providing another two pro-slavery votes in the Senate, for the South's ' peculiar institution ' was a built-in part of the Texan way of life. Some of the Southern diehards proposed to partition the new state, if it were admitted into the Union, into five or six states, all slave supporting. But this Southern irredentism was based on more than sectional self-interest in perpetuating the influence of the slaveholders in Washington, or even an understandable racial bond with the martyrs of the Alamo and the victors of San Jacinto. By the early 1840s many voters, even in the North, agreed that the nation's ' manifest destiny ' included not only expansion to the Rio Grande but to the Golden Gate, for California and the South-west were still part of Mexico, and Texan annexation would be but the first step to the liberation of the Far West. Finally, with that impudent flair for pushing national politics into a frenzy from the geographical periphery, which in the next century characterized the ambitions of Ulster and Algiers, the Texan Government announced that if statehood were not forthcoming from Washington, Texas would seek admission into the British Empire. A Texas Navy was formed to emphasize the threat.

This was the last straw which made the Texas issue into a great national debate by the time of the 1844 party conventions, for the anti-slavery forces were as emphatically against annexation as the slaveholders were for it. The stage was set for the brawl of the election when the Democratic convention ditched Martin Van Buren, a New Yorker, and President from 1837 to 1841, and gave the nomination instead to James K. Polk. Van Buren was an opponent of annexation, and Polk had a threefold advantage. He was a Southerner from Tennessee, he was pro-annexation, and he was a ' dark horse ' candidate (of which Wendell Wilkie was a recent

Republican example) whose general political views no one faction of the Democrats could question. Polk's opponent was Henry Clay, the veteran Whig politician, a stalwart of the age of Jackson and John Quincy Adams—and an unsuccessful presidential candidate as long ago as 1824 and 1828. Clay was the victim of the double disadvantage of being a protectionist and of having indecisive views on annexation. Therefore he forfeited the anti-slavery Whig votes in the North to the Liberty Party (Birney's out-and-out anti-slavery party), while in the South he lost the annexationist Whigs who naturally voted the Democratic ticket. The Democrats' election jingle harped cruelly on this weakness of their rival:

> " Hurrah for Polk and annexation,
> Down with Clay and high taxation."

Even so the election was a near thing for Polk, for he won only by a 40,000 majority of the popular vote, with the Whigs bitterly blaming the Liberty Party for vote-splitting. In New York alone, 20,000 aliens were quickly naturalized to vote in the election, while in Louisiana a keen Democrat sailed a Mississippi steamboat loaded with party supporters up the river and at each town the whole delegation got off and voted for Polk. But as a result of the defeat, the Whigs began to disintegrate, and hardly lasted the decade. Reconstituted with other anti-slavery forces in 1854-56 as the Republicans, their day was to come.

The will of the people having been now obtained for annexation, only the consent of two-thirds of the Senate in its treaty-making role now stood between the Union and the Rio Grande. Professor Brogan has written of the treaty ratification powers given to the Senate by the Founding Fathers, whose prescience had envisaged exactly such a conflict as that over Texas, one of geography as well as political ideology:

> 'The power given to the Senate was very deliberately given, for one of the dangers to the unity of the United States under the Articles of Confederation was created by the fact that each state, or group of states, suspected the rest of being willing to barter away the rights of others . . . sectional quarrels like these fully justified giving to just over a third of the states (for that rather than a third of the Senators plus one was the real safeguard) a veto on treaties. . . .'

The Democrats' solution to the legitimate objection of the Northern states to Texan annexation, an objection easily sustainable by the two-thirds rule, was daringly simple. Even before the accession of the Polk administration on 4th March, 1845 (Inauguration day was changed to 20th January by the XXth Constitutional Amendment just before Franklin Roosevelt's first term), John Tyler, the outgoing President, urged Congress to act in the matter of Texas. Following this presidential injunction, on 1st March, 1845, Congress passed by a simple majority a resolution giving the Government power under internal United States law to make arrangements to admit the Republic of Texas into the United States. As a result of this staggering 'evasion' (Brogan) of the constitution, for Texas was a sovereign state, the Northerners were dished, the Texas Congress eagerly assented in its own abrogation, and on 29th December, 1845, Texas became the 28th state of the Union—but also the last slave state ever to enter.

The Democrats had successfully parleyed Texas into a victorious presidential election and another two slave votes in the Senate. After the railroading of the Upper House by Tyler's message, they were now able within just over a year of Polk's accession to involve the United States, not unreluctantly, in the logical end of

their Texas policy—an expansionist war with Mexico. For with Texas the administration had inherited the foolproof *casus belli* of a frontier dispute. After 1836 the Mexicans had refused to recognize the Rio Grande as the Texan frontier; they claimed instead the line of the Nueces River, in places well over 100 miles to the north. When the disputed river line of the Rio Grande became the frontier of the United States as well as that of Texas, the Mexican Minister left Washington. Polk wasted no time and sent General Zachary Taylor with 4,000 men to the area of contention. The provocation succeeded and Taylor's troops were attacked by Mexican irregulars. The dispute was already moving from the control of the politicians to that of the soldiers. When the news of the incident reached Washington, the President sent, on 12th May, 1846, the message to Congress that announced that Mexican forces had invaded U.S. territory. Congress responded with alacrity and declared that " war exists by act of the Republic of Mexico." There was no suggestion of arbitration, no summit meeting was mooted between Polk and the Mexican dictator, Antonio Lopes de Santa Anna.

Heavy fighting had been going on for at least a week before the declaration of war, for such a formality counted for little in the explosive situation on the Texas steppe between the two rivers—the cockpit of Texan independence. Taylor, ' old Rough and Ready ', had forced the mouth of the Rio Grande by the two actions of Palo Alto and Ruesca de la Palma on 8th and 9th May, and the road across the Mexican frontier into the mountains of the Sierra Madre lay open.

Paradoxically, although the politicians had contrived the outbreak of war with great skill and sophistication, there was nothing particularly new in either the strategy or tactics of Taylor's campaign. It was a war of attrition rather than of movement, and in the use of cannon to repel infantry attacks looked back to Napoleonic, and even to 18th century precedents. It was not until the Civil War, strategically based on the railroads which facilitated large troop movements and tactically dependent on fast-shooting riflemen to defeat the infantry, that there was a true revolution in 19th century warfare. Taylor moved cautiously across the Rio Grande and stormed Monterey, 100 miles across the frontier, in September (Lieutenant Ulysses Grant first distinguished himself in this action). But Santa Anna's main force still remained to be defeated, and in Washington the War Department decided to open a second front against the Mexicans by launching an amphibious landing against Vera Cruz, from where, it was hoped, General Winfield Scott's force could march to Mexico City along the route originally taken by Cortez. (Captain Robert E. Lee was in this force.)

The basic problem remained, that of Santa Anna's army-in-being in the north. Taylor's augmented force had been stripped for the Vera Cruz landing and he left it until after the new year of 1847 to move to Saltillo, another 50 miles beyond Monterey, in the great peaks and massifs of the Sierra.

Then, on 20th February, Taylor's scouts, the Texas Rangers, brought news that Santa Anna's army was advancing towards the American outpost at Agua Nueva. Dissension now broke out on Taylor's staff, for the commander wanted to fight where he stood, outnumbered 20,000 to 5,000, on a large plain. General Wool, backed up by Taylor's senior officers, insisted that the force fell back to the pass of Angostura, near the hacienda of Buena Vista, which protected the invasion force's supply lines to Monterey and Texas. Taylor gave way and the Americans retreated to a position near the pass lining a ravine-cut plateau. By the 23rd the two armies stood face to face. Taylor's men were more strongly placed than the Mexicans realized, for the ravines were a superb natural defence to an outnumbered force and the American flank, resting on a spur of the Sierra Madre, could not be turned.

Apart from dragoons and riflemen, held in reserve, the American line consisted of dismounted cavalry, three batteries of artillery, and four infantry regiments. Next to the cannon which guarded the pass stood the 1st Illinois and the 2nd Kentucky, then Colonel Thomas Sherman's artillery (not the Sherman who brought total war to Georgia), and to Sherman's left the 2nd Illinois, Bragg's artillery, and then Lane's Indianans. The left flank was guarded by cannon of the battery commanded by John Washington, whose guns also held the pass. Kentucky cavalry guarded these cannon.

The flimsy line was first attacked by a massive Mexican force which infiltrated through the ravines, and for a short time it seemed as if the Americans were routed. Lane's Indianans ran for it, and only a section of Washington's artillery, firing canister shot from 50 yards, stopped the flight. Mexican cavalry failed to shift the guns, and then Wool switched his Illinois infantry to stop the hole. The crisis was ended with the arrival of Taylor himself at the spot with dragoons and Mississippi riflemen commanded by Colonel Jefferson Davis. Davis, later to become world famous as the President of the C.S.A., was already well known in the South as Taylor's son-in-law and a West Point man. His later career as a Union politician included the position of Senator for Mississippi and Secretary for War. Davis's men went into action with Taylor himself leading the cheering, "Well done, Jeff..... Hurrah for Mississippi....." But his best-remembered exhortation of the day was that to Braxton Bragg, "Pray give them little more grape, Mr. Bragg." Another less genteel version of the order to the battery commander, who became a Confederate major-general and fought at Shiloh and Chattanooga, was, "Double-shot your guns and give 'em hell."

But Taylor had not yet won the day with the ending of this serious setback. By the early afternoon the Americans had been driven back, in order, half a mile. A Mexican cavalry sortie against the baggage train had been beaten off by the dragoons; next Santa Anna decided to try to break the Americans by massed infantry attacks. All American reserves were now committed, but the ravines, carefully guarded by pickets, now helped the defence as Wool had foreseen before the battle, for the dry, rocky fissures formed perfect trenches. Backing the infantry were the three artillery batteries which proved quite decisive. "Again the triumphant foe charged the plateau, but the concentrated fire of our 12 guns proved too much, and after four futile attempts on the batteries, they sullenly withdrew under cover of their own guns . . . ," commented an American observer. By brilliant concentration of his guns, Taylor had the battle in his hands.

By nightfall it was all over, and the American sentries realized that a great movement of the Mexican forces was taking place. Shattered by the tenacious American defence, Santa Anna was withdrawing from the battlefield. At a cost of only 600 casualties Taylor had won a decisive victory in destroying the Mexican's main force. It was too far for Taylor to march to Mexico City; that was left to Scott's army, which forced the pass of Cerro Gordo and entered the capital on 14th September, 1847. Another U.S. army had forced the Santa Fé trail into western Mexico after marching all the way from Missouri.

Just as bold was the conquest of California, taken by a combined settler rising and a naval force which had sailed round Cape Horn. The Mexican Republic had been completely defeated by a ruthless military operation planned on the grand scale.

With the fall of Mexico City, political considerations again became paramount. Polk indignantly complained that his opponents had accused him of " starting a war to gain territory by overpowering Mexico." To show his moderation he spurned his own extremists clamouring for the annexation of the whole of Mexico. By the treaty of Guadelupe, signed in May, 1848, the United States merely annexed all the land north of the Gila and Rio Grande rivers, a vast area stretching from Texas to northern California. In consideration of the 800,000 square miles of territory thus annexed, Polk agreed to pay the Mexicans 15 million dollars; Mexican resentment of this *diktat* was so great that as late as 1917 the Mexican Government was intriguing with Imperial Germany for the return of the lost lands, as discussion of the Zimmermann telegram episode has reminded us.

As a result of his victory at Buena Vista, Taylor was nominated by the Whigs as the next presidential candidate, and won the election, although he died in office after only a year in the White House. Territorially the chief result of the war, of course, was the triumph of ' manifest destiny ' and the extension of the United States from ocean to ocean; apart from California, which was constituted as a free state in 1850, the rest of the ' Mexican Cession ' was organized as the two United States territories of New Mexico and Utah.

But it was less the acquisition of these territories than their internal organization which had the greatest eventual significance for the United States. Less than two years after the end of the Mexican War, Congress decided that the question of the existence of slavery in the lands of the Mexican Cession should be decided by popular sovereignty. As slavery had been abolished in these lands under Mexican rule, and as the ' Missouri Compromise ' of 1820 had specifically precluded the extension of slavery north of 36° 30′ in the adjacent lands of the Louisiana Purchase, the great debate on slavery now went beyond the point of no return. By 1854, by the Kansas–Nebraska Bill, it was proposed, with the settlement of the Mexican Cession as a precedent, to admit popular sovereignty in all territories of the Louisiana Purchase. This was even less acceptable than the granting of ' squatter sovereignty ' to the New Mexico and Utah territories, and led directly to the formation of the Republican Party, a grand coalition of all anti-slavery forces. Finally, by the Supreme Court Dred Scott decision, which abolished the Missouri Compromise and removed jurisdiction over slavery from Congress, the Civil War became almost inevitable.

The Texan settlers and Polk had won a great electoral success. Taylor had bravely fought his way to a great victory at Buena Vista. The South had continued with the Mexican War the series of politico-military successes that had started with the Missouri Compromise. The United States had become the most powerful continental power in the Americas. All these results stemmed from the Mexican situation. The result that no one could see in the moment of victory was that the South's hubris had overreached itself with Taylor and Polk's triumph and that the road to Appomattox Court House lay ahead.

THIE LINDER

By Lieut.-Colonel J. D. Lunt

'TACTICAL Exercises without Troops' is how the *Training Manual* describes them, but the Army always refers to them as TEWTs, pronounced to rhyme with newts. TEWTs always figure prominently on every military training programme and I often wonder who was the military genius who first devised this method of teaching tactics. Did Hannibal hold a TEWT before he crossed the Alps, or Caesar before the Rubicon? Perhaps Wellington filled in the time of waiting behind the lines of Torres Vedras with TEWTs for his officers, but somehow I doubt it. "It all depends on that article over there," he probably replied to Croker, when questioned on the subject, pointing to a British private gawping his way along a Brussels street, "and if the officers can't be leading him in battle, then they'd very much better be hunting!"

There are, of course, many variations on the TEWT. War games, for example; which sound infinitely more sinister, and which have their ludicrous side as well, as witness the story of Sir Henry Wilson darting about on one side of the table wearing Foch's *képi*, while Foch presumably wore whatever form of headgear the British Army was wearing at the time—a Broderick cap perhaps, or maybe even a glengarry? And there is the Americanized version, the CPX, played with chinagraphs on maps, befuddled with overlays and obscure abbreviations, and presided over by such strange-sounding satraps as COMCINCLANTMED, or even SACEUR.

For myself, I prefer the TEWT. There is a pleasantly rural touch about them, for who has ever set a TEWT in a marshalling-yard or an industrial suburb? New-mown hay, bees in the clover, and beer and sandwiches in some bosky dell are all essential ingredients in any properly organized TEWT, and the ground rules are equally simple. First, that the decision of the senior officer present is final on any tactical problem, however strongly everyone else may disagree with his views! And secondly, that there should be a pub or hotel conveniently close so that the directing staff can repair to it from time to time, ostensibly to discuss the 'school solution,' but actually to recoup their flagging energies and to keep in touch with the Test Match. TEWTmanship is not born in one, however, but comes from long, and sometimes bitter, experience. It is not easy, for example, to give one's undivided attention to the correct locating of 'B Echelon' when the sun is shining on a warm afternoon, the bees are buzzing, and one is comfortably replete with beer and Cornish pasties; under somewhat similar circumstances the boa-constrictor retires into the seclusion of a thicket until its mental processes can begin functioning again, but not so the student on a TEWT. However torpid he may feel, he must still keep at least one ear open lest he is suddenly posed with some conundrum, such as how and when does he propose to give the men their evening meal—an old favourite this on every TEWT!

Not very long since, I spent a long afternoon waging a losing battle against sleep as we fought our imaginary way up and down a pleasant German dale. The bees were out in their squadrons, the larks sang in a clear blue sky, and we spread our maps within the shade of an enormous linden tree. It was high summer and a public holiday in Germany, and there was a continuous flow of traffic along Route 1 which passes within half a mile of the linden tree. We were certainly not the first soldiers to have studied their maps and discussed tactics beneath that tree, for Route 1 is the oldest road in Germany and soldiers of every race and creed in Europe

have marched along it at one time or another. Napoleon travelled that road on his way to Moscow, and Eisenhower on his to the Elbe. Men with spears and long-bows, knights in armour, wild-looking Cossacks on their shaggy ponies, Murat with the reserve Cavalry, and Americans in tanks. Some of them must have halted by the linden tree and wondered at its size, as we did.

There has been a linden tree on that spot ever since A.D. 500. The original tree was known as 'Thie Linder,' or the Assembly Tree, because the village elders used to meet beneath its branches to dispense justice and to take counsel between themselves. The present tree is not particularly old, but some years ago it was struck by lightning and the massive trunk split in half. The villagers have filled the gap with earth and clamped the two halves of the tree together with iron bars, which somehow or other adds to its venerable appearance and size. There is no longer any need for the village elders to meet beneath its branches, and so instead they have built a bench where the old people can sit on a sunny afternoon, and presumably the young people for their courting after dusk.

Tilly halted there on the first night of his march from Hameln on the way to sack Magdeburg. He set up his field-kitchens in the fields around the tree and to this day the villagers refer to the place as 'Tilly's Kitchen.' It requires no great effort of the imagination to picture the scene; the villagers looking on in awe as the rapscallion Imperialist soldiers roasted oxen on the spits over open fires, sharpened their pikes and swords, and swore great oaths as they discussed the pickings to be had at Magdeburg. The creak and clatter of the ox wagons as they toiled to and from the village bringing corn from the barns and wine from the cellars; on requisition, of course, but with no intention of payment. The neighing of the horses, the smell of leather, and the sudden clatter of hooves as a dispatch rider came galloping down Route 1 on his way to Tilly's headquarters. The Imperialists, we are told, halted there for two or three days before moving on and they left a sufficient impression with the locals that their passage is remembered to this day.

I wonder whether Tilly conducted a TEWT beneath the linden tree on the best way to capture Magdeburg? And if he did, whether he was more successful than I was in keeping his syndicate awake?

THE MINING OF INLAND WATERWAYS

By Captain J. S. Cowie, C.B.E., R.N. (Retd.)

TO the mine warfare enthusiast, the laying of mines in the inland waterways of an enemy Power has an irresistible appeal, but in other than special circumstances it is impracticable to employ surface or submarine craft for the purpose. The mines must, as a general rule, either be launched clandestinely from the banks of a river or canal or dropped from the air.

The first recorded operation of this nature fell within the former category, when in the first World War the Germans brought two moored mines, of a somewhat crude type, from Baghdad to Suez on the back of a camel and planted them in the Canal. It is an inherently difficult proposition to carry out orthodox minesweeping operations in a river or canal, and it is equally difficult to provide an adequate watching force to locate the positions of individual mines. On this occasion, however, the British evolved a simple but effective countermeasure by dragging a baulk of timber along the bank of the Canal, thereby smoothing down a strip of sand along its whole length. When the Germans attempted to repeat their effort, the tracks of the camel were clearly visible where they crossed the smooth sand, thus enabling the mines to be located and disposed of with the minimum of delay.

The second recorded operation, of a similar but rather more sophisticated type, was carried out in the early days of the second World War, when the British Admiralty set up a special organization to plant various types of drifting mines in the headwaters of the River Rhine, with the object of menacing enemy river craft, barges, bridges, and pontoons. As the mines had to be handled in the dark over rough and unfamiliar terrain, they were of necessity small and simple, but none the less some degree of success was achieved. As an example of the blind faith placed in the designers of the mines, they were invited by higher authority to arrange that should any of them drift right down the Rhine and emerge into the open sea, they would automatically become safe, in order to ensure that Allied ships would not be endangered. This invitation was regretfully declined, but it is fair to say that in the present state of the art it might be accepted.

With the advent of aircraft as potential minelayers, the scope for such operations was in theory greatly increased, particularly in the vast network of inland waterways in Europe, but for various reasons it proved difficult in practice to make the necessary aircraft available. In June and December of 1940, however, mines were laid in the Kiel Canal by Wellingtons of No. 5 Group, Bomber Command, R.A.F., but it was not until 1942 that operations on any scale appeared to become feasible. Following on the arrival in Great Britain of large numbers of American bombers, a comprehensive plan was concerted with the United States authorities for the laying of British mines in European waterways. Owing to the shape and the disposition of the bomb cells in aircraft of American design, it would have been impossible to install 1,800-lb. British mines of the standard length and diameter, but this difficulty had been foreseen by the Admiralty, and in the early stages of the war a smaller 1,000-lb. version had been designed and produced in anticipation of a possible need to equip American bombers. To the deep regret of the planners, all the American bombers based in the United Kingdom were assigned to high-level daylight bombing missions and the projected minelaying operations had to be abandoned.

Meanwhile, the Germans had not been slow to appreciate the value of minelaying by aircraft in inland waterways, and they had caused considerable interruption of

traffic in the Suez Canal by this means. Various countermeasures were tried, including the establishment of a large mine-watching organization and the stretching of nets over certain portions of the Canal. The most effective method, however, in so far as magnetic mines were concerned, proved to be the use of Wellington aircraft fitted with a large coil energised by a petrol-driven generator. This device had already been tried in the open waters of the North Sea, but difficulty had been encountered in determining with any degree of accuracy the area actually swept. No such difficulty arose where, as in the case of the Suez Canal, the minesweeping aircraft could fly at low altitude over a narrow and clearly defined strip of water.

In April, 1944, Lancaster aircraft of Bomber Command laid mines by night in the Koenigsberg Canal. This was a skilfully conducted operation, the heavy bombers flying practically at sea-level; indeed, one of the tail gunners subsequently stated that at one point his head was below the top-mark on one of the buoys at the entrance to the Canal.

In April and May of the same year, as a prelude to the Normandy landing, the R.A.F. laid some 4,000 mines in various areas off the enemy-occupied coasts. In connection with these operations, the Commander-in-Chief, Bomber Command, was asked whether he would again consider laying in the Kiel Canal. He eventually agreed to do so, but in view of the greatly increased scale of anti-aircraft defence and the improvement in detecting devices in the area, he stipulated that the operation must be carried out by high-speed aircraft and he selected Mosquito fighter-bombers for the task. This very proper decision, however, presented a somewhat serious problem, for the smallest available mine was too long to be loaded into an aircraft of this type; time, moreover, was extremely short, as the deadline for the attack was the night of the 12th/13th May, the last occasion upon which the moon would serve. The problem was solved in a practical but perhaps somewhat unorthodox manner, for the Admiralty had in the early days of the war set up what was known as the ' MX Organization ' for the very purpose of producing small numbers of non-standard mines when special requirements of this nature arose. The organization, largely ' manned ' by members of the Women's Royal Naval Service, was therefore directed to chop about one foot off the end of a dozen of the smallest standard mine cases, take them to the nearest explosives filling station and thence to the selected airfield, and to assemble the rear ends of the mines (containing special actuating mechanisms, etc.), and transport them direct to the same airfield. The mine cases, in which the explosive had not yet cooled down (a circumstance which gave rise to some minor grumbling on the part of the truck-drivers concerned), duly arrived at the airfield, where the rear ends were joined up and the final adjustments made by the waiting Wrens, the aircraft taking off with not many minutes to spare.

One Mosquito failed to return from this mission, but it is certain that the remaining eleven successfully laid one mine each in the Canal. Subsequent aerial photographic reconnaissance failed to establish that any enemy ships were actually sunk, but did establish that a very large number were held up for some days, and from an examination of the photographs the Ministry of Economic Warfare estimated that the indirect result of the operation represented a loss to the enemy of no less than 3,000,000 cubic tons of vitally important cargo.

In the same month, Liberator and Wellington bombers of the Mediterranean Allied Air Forces had begun a comprehensive series of minelaying operations in the River Danube. These operations had in fact been planned in detail at the Admiralty many months before, but it was not until the year 1944 that the necessary aircraft

could be made available. By the end of October, 1944, approximately 1,200 mines had been laid in the river, and some 200 enemy ships and river-craft had been sunk or damaged, a return rate of roughly six mines per casualty. This rate approximated to that to be expected at the beginning of a series of operations in a new area, but that it should have been maintained over a period of seven months was altogether remarkable. As already noted, the mines carried by the Liberators had of necessity to be small, and therefore comparatively simple, but even if it be conceded that the local conditions presented the enemy minesweeping organization with a difficult problem, their performance must rank as an all-time high in the annals of sustained ineptitude.

Finally, this brief review would be incomplete without reference being made to the laying of mines in the Norwegian Inner Leads, a series of channels some 500 miles in length running inside a chain of off-shore islands, and used by the Germans not only for the passage of their iron-ore traffic from Narvik but also for the conveyance of sea-borne supplies to their U-boat bases in Norway. Strictly speaking, the Leads did not constitute an inland waterway in the true sense of the term, as they could be entered from seaward at various points along their length, but this very characteristic enabled them to be mined on several occasions, not only by British minelaying destroyers and submarines, but also by small Norwegian-manned craft lying-up by day and laying their mines secretly by night in areas with which the crews were familiar.

The ability to penetrate the Leads in this manner, however, cut both ways, as the Germans could divert their traffic into the open sea while the minefields were being cleared. In so doing, of course, they lost the protection from surface and submarine attack that represented their primary object in using the Leads at all, and a very early appreciation made at the Admiralty showed conclusively that the proper use of mines in those waters was in fact to drive enemy traffic to seaward and into the arms of a waiting task force rather than to attempt to interrupt the flow of that traffic simply by the laying of mines alone.

Such a plan had the merit of concentrating all the necessary forces in the right place and at the right time, as it would enable the laying of the mines by ship-borne aircraft to be related to the density and movements of enemy traffic, as established by reconnaissance aircraft carried in the task force itself. It was not, in fact, found possible to put this plan into effect until the closing stages of the war, but it had earlier been realized that over the greater length of the Leads the depth of water was considerable, and that the few suitable minelaying areas were difficult to identify from the air. This difficulty was overcome by smuggling a Norwegian maritime pilot out of the country, who drew sketches and made notes to aid the crews of the reconnaissance and minelaying aircraft. A task force comprising light aircraft carriers, cruisers, and destroyers was then set up, and a series of successful operations carried out.

To sum up, it seems clear that the mining of an inland waterway can have an effect that is out of all proportion to the manpower, material, and money expended, and it is submitted that we should be well advised to bear this proposition in mind in any future hostilities.

INTEGRATION

By Major T. G. Alexander, The Somerset and Cornwall Light Infantry

WE are constantly being reminded that if we are to survive as a nation, economies must be effected in both manpower and money. Put another way, this might be taken to mean that nationally we must obtain greater output and better value from these two commodities in the same quantity and quality in which they exist to-day.

Speaking on 10th March, 1959, in the House of Lords debate on the Defence White Paper, Field-Marshal Lord Harding said; "If our forces are to be of the kind the White Paper described, there would have to be a streamlining of the systems of supply, of provision of armaments, and of improvement of accommodation and living conditions." Lord Swinton, speaking earlier in the same debate, had said; "Someday we might see the complete integration of two or more of the [fighting] Services. It could not be rushed and could only come as a natural growth out of close and trusting co-operation and experiments in integration between equal partners."

This paper does not seek merely to scratch timorously at the surface of the problem and then sanctimoniously to agree with these two statements. It begins by assuming that integration, to a greater or lesser degree, is inevitable and that this must begin at the top. After all, a school does not have two headmasters—one for arts and one for science. It has one whose task, irrespective of his own earlier background, is the overall direction and control of all departments of that school to produce the finest results possible. So it must be with the fighting Services. We require, first, integration at the top, one headmaster—one director.

Take next an example of the question of supplies. In our own domestic lives we, generally speaking, deal with one merchant for one type of commodity. We do not, as a general rule, buy our coal from three different coal merchants. We obtain satisfaction from one and we stay with him because he provides the best combination of quality, quantity, and service. The particular example of coal may not be directly applicable to the fighting Services but there are many items in common usage which are obtained from different sources at doubtless differing prices and quality.

The plain fact is that we must cut our cloth according to our purse. Integration, whether you regard it unkindly as 'nationalization' or more humanely as 'unification,' is, as this paper sets out to demonstrate, inevitable if only because of the economies it must achieve. Therefore the argument is not how to stall off the inevitable but how to make it work and how to get the best out of it.

Let us then examine to what extent integration is possible, whether operational efficiency will be improved, and what economies can be made. It must be accepted that any alteration to the present structure should be made only if it can be proved that it will provide a saving in men or money without loss of efficiency. There must be no question of throwing away the old unless there are very real advantages to be obtained from the new.

Background Review

Proposals to cause the merging of the three fighting Services are no new thing. It is a most delicate subject, necessitating a complete change in long-established tradition and mental habits. It has been said that the Royal Navy is a versatile Service in which all think differently, the Army a well-disciplined force in which all are trained to think alike, and the Royal Air Force so fast moving a combination

that no one in it has any time to think at all. The point is that, in spite of joint Service training, to which much lip-service but only meagre practical attention is paid, we all think of ourselves as being 'different' and it is in this habit of thought that many of our difficulties lie. We must, as Lord Swinton said, get "closer and more trusting co-operation" on an equal partnership basis.

As long ago as February, 1922, a Coalition Government under David Lloyd George appointed a Committee with terms of reference "to make definite proposals for amalgamating as far as possible the common services of the Navy, Army, and Air Force, such as intelligence, supply, transport, education, medical, chaplains, and any other overlapping departments in order to reduce the cost of the present triplication." The findings of the Committee were presented to the Government in January, 1923, but were not made public until the summer of 1926 when Stanley Baldwin was Prime Minister.

A number of unpleasant things came out in this Report. It is evident that the Services themselves made great efforts to prevent integration of any sort and, because they held a majority position on the Committee, these efforts were successful. Major-General Sykes, writing in *The Army Quarterly* in April, 1926, said, ". . . before the advent of the Air Force and air power, the Navy and the Army could be segregated with the necessity for only a small degree of co-ordination. Now [in 1926] neither is self-dependent. Furthermore, armies and navies can now be attacked at their bases and at the industrial source of their supplies. On the other hand, it is equally clear that air power has not made sea or land power obsolete. Sea communications are of prime importance and the Army remains the holding force on land."

The Committee found evidence of much triplicated expenditure and recommended the merging of the three Service departments into a triple-branched combination under a single control. This, it was suggested, should take the form of a Ministry of Defence with, initially, an embryonic defence staff. Concurrently, joint staff training should begin and the products of these colleges should take their places in this defence staff.

Writing in the October issue (1926) of the same publication, Major-General Sykes, who was, by the way, a Member of Parliament as well as being a distinguished retired soldier, gave further details of the 'Reduction of Defence Costs, Recommendations.' He dwelt, in particular, on the report of the sub-committee on the amalgamation of services common to all three fighting Services. It was clearly established that this would lead to economy in the purchase and inspection of stores, management, personnel, and training facilities, and to the eradication of triplication of overlapping margins in defence and competition in status, i.e. inter-Service wrangling.

Positive action to put these recommendations into immediate effect was confidently expected, but nothing came of it. The reasons for this were believed to be two-fold and, surprisingly enough, much the same as one might well encounter to-day. First, vested interests were thought to have brought pressure to bear against the proposals. Second, the fighting Services themselves, while openly paying lip-service to the scheme and not daring to deny the obvious financial saving, brought the full weight of Service propaganda to bear to magnify many minor difficulties which could be found or trumped up.

Co-ordinating committees had already been set up but these were subsequently described as 'distinctly inefficient.' Doubtless they were intentionally so. Some of the numerous examples of 'go-slow' tactics used, or what to-day we might fashionably term 'work-to-rule,' were as follows.

Medical. Although a Joint Services Medical Council was to form and meet, not once did it do so in the first year under review. One or more representatives found the proposed meeting dates 'inconvenient.' The only agreement that appears to have been reached in the whole of the medical field, which ranged from such lofty proposals as the opening of the hospitals of all three Services trilaterally to the common procurement of safety pins, was bilateral agreement between the Army and the Air Force upon the use of some very minor and quite trifling medical record form. At the time that this problem of possible integration was studied (30 years ago), the Air Force felt that Army hospitals were run at far beneath the minimum standards required by the Air Force and hence sharing was unacceptable. The Navy flatly demanded hospitals solely for naval personnel and appears to have insisted that the empty, unused beds be retained against any possibly unforeseen naval emergency requirement.

We are little better today. For example, naval patients from Greenwich are sent over 25 miles by naval ambulance to a naval hospital at Chatham when there is a large and well-equipped military hospital less than five miles away in Woolwich. Which Service is at fault here is not discussed. The point is made. When this particular example was mentioned in conversation to a very senior naval officer, he remarked, in all seriousness; " There's obviously a good reason for it somewhere. The treatment is different of course." But are we honestly to believe that, depending upon the colour of our uniform, so the treatment for our ills is fundamentally different ? Does the Army enjoy a different brand of mumps ? Or the Air Force have a monopoly upon some special type of appendicitis ?

Fuel Supplies. It was found that all three fighting Services, which between them used tremendous quantities of coal and coke as can be well imagined before the days of oil burning, were each contracting separately and severally and all paying widely varying prices. Might we not find analagous if not identical examples in spite of the late Ministry of Supply ?

Transport. When one considers the basic, load-carrying vehicles needed by the Services, it seems ludicrous to find that we could not even agree to standardize these. The best that was achieved was an experiment between the Army and the Air Force to try to agree upon one standard ambulance, but even this reached a stalemate.

Let us take a quick look across the Atlantic to see what has been happening over there.

First of all to Canada, where integration is rapidly taking root. Here both the chaplains and the medical services respectively have already been amalgamated. Here also, cadets for the fighting Services spend the first two years of Service life in the same establishment, wearing the same uniform. Here the Prime Minister has recently announced that he intends more integration in the future. Of course, he admits, there will be difficulties but these " must and will be overcome."

Since VJ-Day, the Americans have unified their top defence organization and the National Security Act of 1947 resulted in the setting up of the National Military Establishment. The Act also provided for a Secretary of Defence who had " general direction, authority, and control over the three Services." The Department of Air emerged from this Act, as did the lawful establishment of the Joint Chiefs of Staff. This latter body differed initially from ours in that it had no Chairman, and it suffered from another flaw because the Joint Chiefs of Staff had no suitable military staff in the Defence Department.

Set up at the same time were central research and development boards, a central intelligence agency, and a central munitions board. There was no equivalent to our Ministry of Supply and the three fighting Services procure their requirements direct. In some commodities, however, overall purchase is done through one Service, for example, whichever has the greatest consumption. The Air Force buys all the photographic film, the Navy the fuel, the Army the boots and shoes, and so on. Since this paper was originally drafted, the British Ministry of Supply has disappeared and it seems likely that a system similar to the American one may be tried out in this country.

What of the future in the United States? Professor B. Leach, who is Professor of Defence Studies at Harvard, wants to go further. He wants one unified fighting Service and he sees no more difficulty in joining them together now—virtually overnight—than there was in disjoining the Army and the Air Force in 1947.

So much for a look across the Atlantic. Let us go on to examine the pros and cons of introducing integration, to a greater or lesser degree, sooner or later, in this country.

Command and Staff Aspects

Nearly five years ago, Field-Marshal Lord Montgomery in a lecture delivered at the Royal United Service Institution said he saw no reason why a rear-admiral should not command an army division in the field and went on to say that he would have no hesitation in commanding a fleet. It is understood that he has modified his views somewhat since that particular address but the illustration serves to make the point that we must produce people at the top with an inter-Service outlook.

The Service Ministries. Just over three years ago Mr. Duncan Sandys was given, within the limits of Cabinet policy, powers of decision as Minister of Defence and his appointment assumed a degree of importance superior to the Ministers responsible for the Royal Navy, the Army, and the Royal Air Force. He has since been succeeded in the same appointment by Mr. Watkinson. For the first time in peace we have an arrangement which seeks to co-ordinate and control the activities of the three fighting Services, and one Minister with executive, overriding powers over all three.

The idea, of course, is not new. Sir Winston Churchill did that, and considerably more, when he combined the responsibility for Defence with his Prime Ministerial duties during the second World War. He imposed an unprecedented degree of unified control. Many crossed swords with him. Some of his actions were, to say the least, unpopular with the senior Service officers of the day. There may well be some senior officers serving today who fear Mr. Watkinson; not, of course, for the man himself but for the power that he has and the power that he may acquire in the future.

The reader will have noted that this joint Defence Ministry is on the lines of that recommended over 30 years ago and already referred to earlier in this paper. Clearly it will have some disadvantages. The Defence Minister needs to be a man of outstanding merit and above the bickering of party politics. Will there always be a man of such potential available among the senior politicians in the Government of the day? If not, greater responsibility will devolve upon the junior Ministers of the Service Departments and we shall slip back to inter-Service competition. There will inevitably have to be a 'balance of power' between the central Defence Ministry and the three Service Departments.

Conversely, a strong Defence Ministry must result in a weakening in the individual powers of the respective Departments of the fighting Services. Unpalatable

a pill though this may be for some to swallow, it can only result in a streamlining and economy in the long run. There will be those who contend that this Ministry of Defence may result in the creation of yet another ' empire,' but obviously there must be a drastic pruning of the present Service Ministries to counterbalance this. Properly carried out, this pruning must not be merely a reduction in the Service Departments and the automatic transfer of the surplus to a central control at the Defence Ministry. There must be elimination of all triplicated effort.

Having regard to the present size of the three fighting Services, a comparison of the figures of those employed in the ' head offices ' is worthy, in passing, of study. In the following table[1], the unbracketed figures show the position for 1959/60, whilst those in brackets show the corresponding position as it was in 1938.

Services' Overall Strength	*Nos. Employed at ' Head Office '* (*Officers and Other Ranks*)		(*Civil Servants*)	
1959–60 (1938)	1959–60	(1938)	1959–60	(1938)
Admiralty 98,000 (112,000)	764	(228)	9,398	(3,672)
War Office 293,000 (119,000)	1,514	(420)	4,600	(2,140)
Air Ministry 168,000 (73,000)	1,263	(199)	6,566	(3,419)

Just look at the numbers at the Service Ministries. None less than double the pre-war numbers. There is an old saying that statistics are like sausages (and just as mysterious in content !) and it depends what you put into them, who cooks them, and for whom they are being prepared. But even granted all that, there must be some moral to be learned from the undeniable figures quoted in the above table.

There must be ample scope for economies within the three Service Ministries and, indeed, additionally in the Home Office (for Civil Defence). It is almost certain that there is a great deal of internal triplication; perhaps with the inclusion of Civil Defence there is even quadruplication of effort and manpower. Obviously we cannot arbitrarily cut it by a quarter. Compared to pre-war, there are quite large staffs required for research and development, and the introduction, for example, of electronics into all our modern weapon systems has legitimately added to the numbers of headquarters staffs. Yet allowing for all these, it does seem that the growth since 1938 has been excessive.

We need an organization that is decisive, forward-thinking, free from constant inter-Service wrangling and squabbling competition, and a system that cuts delays, avoids duplication, and above all co-ordinates effort and expenditure. We may smile cynically when we hear or read of inter-Service rivalry elsewhere; for example, in the United States over the attempted launching of space satellites and rockets to the moon. We may be tempted to wonder why the effort is not pooled centrally under national control. First let us, however, look round our own house. Are we so free from bickering over who should own the Fleet Air Arm ? Or Coastal Command ? Or the Royal Air Force Regiment ? The newly created Army Air Corps ? And the various types of missile—ground-to-air, air-to-ground, ground-to-ground, and so on ? What we need is control of the whole vested firmly in one single Service Ministry, that is, to make the Ministry of Defence really strong and all-powerful.

Higher Command in the Services. If this central Defence Ministry is to work, we must ensure that sound advice is available to our Parliamentary leaders on Service

[1] The 1959-60 figures are given in the Defence White Paper of that year and the 1938 figures were kindly provided by the Ministry of Defence upon enquiry.

matters. Therefore we must produce senior officers who think nationally and internationally, and divorced from single Service loyalty.

Service loyalty is one of the finest virtues but it can be dangerous. Every man serving in an independent Service naturally looks to that Service for his future prospects and promotion. Ability to work with the other Services is considered an asset, but perhaps not so valuable in itself compared with a man's value to his own Service. There is also the human tendency to attempt to build up one's own Service or Department, to create greater opportunities thereby for personal advancement; in other words, ' empire building.'

If we are to have true co-ordination of the three Services, it is necessary to develop men with the background, knowledge, and experience to become the higher commanders of joint or unified forces. An important limiting factor is certainly that of human adaptability. The problem, therefore, is to create from such specialists the ' generalists ' who become Supreme Commanders, or serve on the staffs of Supreme Commanders in the future. Initially, selection will have to be made from the present senior officers of the three Services, but in the long-term plan these leaders will have to have been ' joint Service trained ' from their earliest days.

We had Supreme Commanders in the second World War, for example, in Eisenhower and Mountbatten. The Supreme Commander principle has continued in S.H.A.P.E. and the appointment currently held by General Norstad. In peace, however, one wonders whether his powers of executive command are not hampered or severely curtailed by political machinations. Field-Marshal Slim wrote: " No Englishman ever got much opportunity to practise high command in peace, and none to be a Supreme Commander."[2]

If we are to be ready for war, surely these ' Supremos ' and their staffs must be ready and working as a well-oiled machine in peace. They cannot be thrown together overnight. As Field-Marshal Slim went on to say in his description of the staffs of the hastily created Supreme Headquarters South-East Asia, and its opposite number, General Headquarters, India, " sometimes they showed the arrogance of ignorance." Later he followed with: " There will always be these frictions (*of personalities*) to a greater or lesser degree in any Supreme Headquarters, but where Allied forces are operating together, there is no effective solution other than a Supreme Headquarters."[3] Hence these integrated Headquarters should be in being now everywhere.

There has been an increased burden on command and leadership in the type of war which has been evolving over the past half-century, involving alliances in which unified action and quick decision have been of paramount importance. The Committee principle is all very fine and large when time permits, but actions in the future are unlikely to give us time to convene committee meetings. Suez was an example of this. We require joint standing forces ready for instant action anywhere and for immediate deployment. Unified command is essential for these forces if they are to be directed immediately to their war tasks. As a corollary to this, politicians should stick to politics and taking their initial decisions, and, whilst obviously retaining the right to interfere, they should exercise that right with very great restraint. The Services are the tools of the politician in the formation of grand strategy, but once he has decided upon the pattern and set the machine in motion, he should endeavour to avoid interference. Perhaps the moral is to be sure that the Services are given a simple, straightforward aim and task. Field-Marshal Slim again

[2] *Defeat into Victory*, Chap. X., Field-Marshal Sir William Slim.
[3] *Afterthoughts*, Chap. XXIII.

said, and this was well before Suez, " Burma was not the first nor probably the last campaign that has been launched on no very clear realization of its political or military objectives."[4]

One of the last acts of Lord Louis Mountbatten in the South-East Asia Command was to call attention to this need to appoint and train Supreme Commanders in peace, and the need for them to be trained in the job with experience of handling the forces, men, and materials which they will have to direct in war. The same goes for their potential staffs.

Recommendations. If the Parliamentary machine is streamlined and we have one Ministry of Defence, it will ensure simplicity of control, provide direct responsibility, eliminate duplication, and cut costs. Further, we must aim to unify the higher commands at home and abroad by introducing the Supreme Commander principle in all theatres abroad and amalgamating the various commands at home.

Field-Marshal Montgomery's original idea of a common promotion list for senior officers of all three fighting Services is neither desirable, practical, nor necessary. If, however, we are to train joint Service commanders capable of exercising supreme command and capable also of tendering sound Service advice to the Parliamentary leaders of the day, a far greater emphasis must be given to officer education at all levels.

Somehow we have got to produce a corps of officers capable, ready, and willing to co-operate and combine towards a common end, having a common doctrine for war and common ideas on how to wage war. It is assumed that this was the original idea behind the setting up of the Imperial Defence College. This particular course, however, comes far too late in an officer's career and to all too few. The same remarks apply to the Joint Services Staff College at Latimer. Good in itself, but too late and equipped for pitifully all too few.

Ordinary Staff College training as we understand it today should be introduced earlier and be truly ' joint Service,' i.e. all combined. There are those who might claim that we do enough already by the interchange of students of the three Services between the present Staff Colleges. In fact, of course, this is not so. We merely pay lip-service to the idea of inter-Service outlook in this fashion. No more than a handful—scarcely double figures in any one year—are interchanged. Those who would have you believe that this is enough are probably the ' Service loyalists ' who do not want their single Service outlook diluted by the stimulation of inter-Service co-operation. It is sometimes difficult at present to find officers who have a genuinely inter-Service outlook divorced from ' own-Service ' prejudice. This may be because the present system of training puts us into watertight compartments from the beginning and makes sure that, but for the annual ' handful ' mentioned above, we jolly well stay there.

One thing above all is the urgent need to break down any barriers which surround our three Services. Thus, even if complete unification is never fully realized, inter-Service co-operation will become a reality instead of remaining, as it is all too often at present, something to which many pay only lip-service.

Let us cast back to a typical example from history—the expedition to capture the island of San Domingo (Hispaniola) in March, 1695.[5] An expedition of about five ships and some 1,400 soldiers was sent out under the joint command of Captain

[4] *Ibid.*

[5] *Naval Warfare*, Colomb (p. 273); *The Royal Navy*, Vol. II, Clowes (p. 486).

Robert Wilmot, Royal Navy, and Colonel Lillingstone. The two leaders, largely because of their differing Service upbringing, were jealously opposed to one another. Wilmot quite deliberately landed the Army party on the ' wrong ' side of the island, i.e. farthest by some 20–30 miles from the headquarters of the local garrison, leaving them a good day's weary march across the island to attack. He, meanwhile, then sailed round to a point much nearer, landed his sailors, captured the garrison, and seized the plunder. So, when the soldiery arrived, after a long and completely unnecessary march, they found the job already done and the loot divided.

This action by Wilmot appears to have been quite deliberate. Lillingstone himself wrote with much bitterness about the operation, mainly, however, it is thought because of the unequal division of the plunder ! Perhaps by poetic justice, Wilmot was unable to defend himself or his reputation, nor did he enjoy the plunder for long, as he died on the return journey home.

Let us hope that no such marked inter-Service bitterness and jealousies exist today. It would be foolish and false, however, fondly to imagine that there is absolutely no undercurrent of feeling. Due to the lip-service paid to joint Service co-operation and harmony, the undercurrent may be well camouflaged.

Teeth Arms

As already agreed, any alteration to the present structure should be made only if it can be clearly established that a financial or manpower economy will result without loss of efficiency. There must be no question of throwing away the old unless there are real advantages to be obtained from the new.

Part of the problem is that each Service expands into the fringe areas of the responsibility of the other two. This must inevitably result in duplication of effort, increased costs in training (especially basic training), and duplication of equipment, development, and supply. The example in the United States of the duplication of effort in the missile development programme has already been cited and needs no further elaboration here.

Only a few examples have been quoted here, and needless to say there are many arguments against changing the present order of things. There is, however, undoubtedly a measure of overlapping and duplication in at least basic training in all of these. It goes without saying that there will be protests from those who see their ' empires ' dwindling if these anomalies are ironed out and they see the horizon of their own personal opportunity being somewhat drastically curtailed.

In addition to the obvious thoughts of ' empire-building ' and ' jobs for the boys,' there appear to be two other main reasons why a Service expands. The first is when a Service feels that one or both of the other two is devoting insufficient thought, money, drive, or development to some aspect of warfare vital to its interests. The Admiralty wanted to regain control of the Fleet Air Arm from the Air Ministry because, say, it felt that aerial warfare at sea, or the protection of ships by aircraft was getting insufficient money to keep it up to strength, or perhaps was lacking in attention to the development of new techniques and new aircraft. Their Lordships had no way directly of influencing the Air Council to increase the emphasis upon naval aviation, so they felt bound to justify a case for taking the job over and making provision for it in their own annual Estimates. The same argument could, in the not too distant future, be applied in the case of Coastal Command, and a ' take-over bid ' made. A similar case has just been made out to justify the formation of the Army

Air Corps. In all these examples it must be agreed that the case for specialized techniques bears consideration.

A second possible major reason is that alterations or developments in a weapon or technique of one Service may cause redundancy in that Service or in part of another. Rather than give in or combine, the tendency, like a drowning man clutching at a straw, is to find some other employment or *raison d'être* for the redundants. There is considerable current controversy over the possibility of the days of the manned fighter or bomber being numbered. The Royal Air Force, while fighting a last-ditch stand in the matter, has already cast around and made out a case for taking over the air defence of the United Kingdom from the Army (Royal Artillery, anti-aircraft). This will then protect the redundant personnel from a reduced Fighter or Bomber Command, i.e. it will have found 'jobs for the boys.' Yet it must be remembered that the Army in the past has always specialized in and possessed anti-aircraft units for this task.

It would help, of course, if we had one consolidated Defence Vote presented to Parliament for the annual Estimates instead of the present divided system whereby each of the fighting Services has separately to bid for its requirement. This would not eliminate the necessity for separate estimates and assessments being made within the Service Departments for land, sea, and air requirements, but the overall figure presented to the House would be for one Defence Vote. The Ministry of Defence would be responsible for drawing up the estimates in conjunction with the Service Departments, the squalid details having been argued and finally agreed by the Chiefs of Staff. Hence, each Service would have been able to comment on the total Vote beforehand and, under the chairmanship of the Chief of the Defence Staff, fringe questions and duplicate expenditure would, we hope, have been ironed out. For example, the funds needed to finance the Army's ships could be agreed between the Admiralty and the War Office and fought for by both Departments jointly in the one figure in the final estimates. Carrying this example further, the Royal Navy could then provide the ships and place them at the disposal of the Army. Something on these general lines is already beginning to take shape in the annual Estimates presented, but even closer liaison would minimize the possibility of any final duplication.

This could be only a first step in the solution. Once the arrangement was working, the whole question of responsibilities could be reviewed and definite lines of demarcation drawn. Should, for example, the Army run its own ships or should they be run by professional sailors?

Whilst still dealing with teeth arms generally, some comments upon individual arms may be appropriate here.

Gunners. Now that all three Services have guided missiles, it may be suggested that all gunners should be interchangeable. This, however, is somewhat impractical because a gunner at sea, for example, must have a more detailed background and upbringing in naval matters, and similarly those on land of army affairs. The complete specialist will probably give better service and perfection than the all-purpose jack-of-all-trades. There may, nevertheless, be scope for the co-ordination of basic training, standardization in weapons, calibre, equipment, ammunition, and so on, to an infinitely greater degree than is practised at present.

Communications and Signals. Under the existing system, each of the fighting Services, as well as the Foreign Office, has its own strategic communications system

and, in addition, each has its own system internally in this country. The immediate integration of one defence network would be an advantage. All three Services are critical of the signals and signals messages of the other two, but this should be no serious bar or argument against the proposal. The Royal Navy ridicules the Army use of abbreviations and the Royal Air Force system of relating priorities solely to the rank of the originating officer. In fact, of course, the Army uses abbreviations, recognizes it, and publishes an official list (*Staff Duties in the Field*, Appendix C), whereas the Royal Navy uses abbreviations but refuses to recognize it as a fact. The myth about Royal Air Force priorities has been alleged to have arisen at Suez.

All these petty squabbles and frictions must be swept aside. The originating of signal messages is largely a matter for the staff. A staff truly joint-Service trained will have had all this pettiness knocked out of it. The communications system can then confine itself to transmitting messages with the utmost despatch and accuracy, which is, after all, its prime role. There would seem to be no valid reason why we should not take the best and most practical ideas from the three existing systems and make one ultra-efficient force.

As with the gunners, it may not be possible to make all communications officers interchangeable, but at least basic training could be co-ordinated, equipment, methods, and procedures standardized, and so on. Let us at least begin the campaign with one joint Service strategic and internal system instead of the triplicated systems at present in force.

Intelligence. The integration of this Branch seems attractive and, you will recall, was referred to in the terms of reference for the 1922–23 Committee. In fact, however, the intelligence officer evaluates the information he obtains and appreciates the likely intentions of the enemy very largely by using his basic, specialized, technical knowledge of his own Service and by placing himself in the corresponding enemy position. To do this he must come from one of the teeth arms of one of the fighting Services concerned, rather than from some nationalized, integrated force. Again the argument of specialized techniques prevails and, in any case, at the higher level, we already have the Joint Intelligence Bureau.

Recommendations. There is a definite need to forge a system which will allow teeth arms to exist as separate entities working in harmony with each other. This does not rule out the possibility of a ' take-over ' of the existing strategic and internal communications systems, and a serious attempt at standardizing the basic training, equipment, weapons, ammunition, and so on of the gunners and signallers.

This paper does not begin to attempt categorically to adjudicate upon the thorny problem of which Service should, for example, control the Fleet Air Arm, the Army's Water Transport, or the guarding of airfields. If, however, we could resolve the financial obstacles and overcome the problems of inter-Service rivalry and prestige, such a study could be made perhaps without tempers rising too high. It is no use denying that some inter-Service feeling exists. The result should be a fair and equitable solution, the overriding principle being that, whatever the outcome, the answer must be in the national interest in both economy and efficiency.

Tail Units

Let us now examine the seemingly attractive proposal of merging the ' tail units.' The expression ' tail units ' in this paper is used to define all Service units which support, service, repair, or maintain the fighting troops—the ' teeth arms.' Two principal reasons for the attractiveness of this proposition are economies in money and men.

Proposals to cause the merging of the three fighting Services are no new thing. The economies were—and still could be—obvious in management, personnel, training facilities, triplication, competition in status, purchase and inspection of stores, and so on. The reasons why the previous recommendations came to naught have already been fully discussed in Part II of this paper (Background Review). The same obstacles would be encountered today. Now that we can see these objections for their true worth, however, they must not be allowed to prevail a second time.

Economies must be effected. Thus a very drastic pruning is inevitable. Would it not be preferable, and indeed more creditable to the fighting Services, if we ourselves got down to doing something real and worthwhile about it? The alternative may well be a civilian, or civil-service type of commission or committee arbitrarily appointed to go into and enforce what would inevitably be some very unpleasant, and perhaps unskilled, measures. It would seem far more to the point that we forestall all this and do the job voluntarily ourselves.

Hand in hand with the cry of " We can't afford it " is the cry, these days, of " We haven't got the men." How many places are there where supply depots and maintenance units of the three Services are all located within a short distance of one another? Yet each functions independently. Little men in dark blue, khaki, and light blue all solemnly triplicating their various daily jobs—buying or supplying food (whether you call it ' rations ' or ' victuals ' !), providing equipment and uniforms (call it ' kit ' or ' gear ' as you will !), driving half-empty vehicles, or staffing only partly used hospitals.

One word of warning must be added here. Civilianization is fashionably quoted as the answer to our manpower problems. " Civilianize the rear areas," they say, " and free the men for the front line," " give us more bayonets," " increase the teeth and cut the tail," and so on. Civilianization could be a snare and delusion. By all means let us reduce the tail but let us not deceive ourselves by substituting civil servants. This means the stupidity of removing mere numbers from the uniformed, active payroll and disguising them with civilian counterparts. If the tail is to be cut let it be an amputation and not a mere substitution.

Apart from its unacceptability to the fighting Services, the question of 'amalgamating,' or 'integrating,' or perhaps 'unifying,' is also unpalatable to sections of the civilian population. It will be remembered that the 1957 proposals to destroy by amalgamation some 32 Army Regiments of Infantry were greeted with protests from both Services and civilians alike. The three fighting Services as a whole could not overnight, it seems, be completely integrated in one fell swoop.

It would seem, however, that by relatively speedy action, some of the ordinary tail units could be combined or merged. This, of course, would cause an uproar from the ' traditionalists.' " Tradition," said Field-Marshal Montgomery, " is a fine thing, but it must not become a bar to progress." So, tail units might well be the first stage. Branches envisaged in this first plucking include supply, transport, medical, chaplains, electrical, ordnance, pay, education, provost, physical training, legal, and women's Services. All these may meet with extreme opposition not only from those whose present and future destinies are closely linked with the branches listed but from a lot of the present senior and middle-piece officers of all three fighting Services. If, however, we get a determined lead from a truly joint Defence Ministry, it can be made to work. Sniping at the list is easy and inevitable. It is easy enough always to find fault if one is determined to be deliberately destructive.

A further proposal is that there be greater proportional representation at the three Staff Colleges, so that they become more clearly joint Service. Let us by all means be critical of each other, but from the standpoint of knowledge and understanding of one another's problems and not, ostrich-like, from the 'arrogance of ignorance.' If this alone can be achieved, the ultimate and inevitable unification will be a much less painful affair.

Summary of Some Famous Current Opinions

Clearly, economy of force in manpower, materials, and finance without loss of efficiency is imperative and possible. Field-Marshal Montgomery put it quite bluntly when he said, "one of the greatest facts is that change is inevitable. Progress depends upon the courage to make decisions to meet the needs of the times." He went on to say, "today, even in basic matters, there is continual disagreement between the three fighting Services and, in some cases, definite friction. There is hidden suspicion at all levels and in varying degrees. We must integrate the Services upon a co-operative basis. We could begin by amalgamating the cadet colleges and Staff Colleges now. We must bring the Services more closely together, even to the extent of combining into one. Combine the cadet colleges and the Staff Colleges and you will produce one completely inter-Service officer trained from his earliest days."[6]

We may not agree with the somewhat drastic proposals of Professor W. Barton Leach, Professor of Defence Studies in Harvard University,[7] and we may not wish to go all the way with his proposals, but if they provoke us sufficiently to jerk us into progress out of relative lethargy, they will certainly have helped. Briefly he reckons that we need, and can undertake without further delay, immediate unification and not just a merger. He goes on to say, "the British say this may come about gradually, but I ask why? I see no more difficulty in joining together the Army and Air Force now, than in disjoining them in 1947. Despite some anticipated cries of anguish, I doubt if the integration of the Navy would be much more troublesome. If all the President's horses and all the President's men really get about this job, I don't think the Humpty Dumpty analogy applies. The delay should be no more than the time required to wear out the old uniforms!"

He then suggests that we should all wear the same uniforms and all be on the same promotion list. He considers the forces should all be apportioned functionally into four, as follows: Continental Defence Force; Atomic Deterrent Force; Mobile Striking Force; and Anti-Submarine Force. It is noted that President Eisenhower himself, while remaining non-committal, is known to support a measure of closer integration. The civil officials in the Pentagon are known to be against the proposal. One cannot resist the mischievous temptation to suggest that the latter body, perhaps like their British counterpart, fear that the economy in manpower might start bang on their own doorstep in the Pentagon!

Summary of Conclusions

Integration, to a greater or lesser degree, of all or parts of the branches of the three fighting Services is inevitable. This must start at the top with a strong, single Defence Ministry to control the Services. A single Defence Vote may help to present a single concerted policy welded firmly together, and to eliminate inter-Service wrangling and bickering.

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[6] Field-Marshal Montgomery giving an R.U.S.I. lecture, Oct. 1955.

[7] "American Problems of Forces and Organizations," by Prof. B. Leach, *R.U.S.I. Journal*, Feb., 1957.

Unified commands are required at home, as well as, at present, abroad. The 1959 White Paper on Defence makes a move in this direction.

More joint staff and command training is advocated and this must come earlier in an officer's career. Further, we must stamp out the ' lip-service ' at present paid to this and similar aspects of integration or joint staff work. Let us get down to the job, unpalatable a pill though it may appear to the ' single-Service-minded ' and the blinkered traditionalists.

The time is not yet ripe for the immediate formation of one single Service. The specialist techniques of the ' fighting ' sailor, soldier, and airman are still needed. Some economies and better understanding between Services could, however, be achieved if certain basic training were carried out jointly, and standardizations made, for example, in gunnery and communications. Our signal centres and overseas communications networks could and should be integrated at once. We should have one, simple, standard signals procedure.

The logistical and administrative systems could be amalgamated. A list of suggested branches in which this could begin has been given above. There is no doubt that there would be a large saving in overheads, in training at all levels, in administration, and, further, in the total numbers, i.e. manpower required. Civilianization is not the answer and attention should be invited again and again to the multitudes employed at the Service Ministries today as compared, say, to 1938.

It is extremely interesting to note that on the very day upon which the closing paragraphs of this paper are being put together, the report of a Select Parliamentary Committee on the provision of medical officers in the fighting Services has just been published. Apart from proposing the recruitment of more lady doctors to cope with the overall shortage of medical officers in the Services, it states that the integration of the medical branches of all three Services would greatly help to lessen the total demand. It singles the War Office out, however, for particularly adverse comment on this latter proposal (integration) and says that a " more flexible approach by the War Office would be more helpful." Here we have, it seems, Parliamentary Committees of 1959 meeting the same sort of opposition their predecessors encountered 36 years ago in 1923.

Certainly all these seemingly heretical thoughts and proposals will stir up protest. Agreed we must never change merely for change's sake, nor must economies be introduced which weaken or impair the efficiency of the machine. The subject is undoubtedly controversial and provocative. If this brief article can stimulate some progressive thought followed by positive action, it will have achieved something well worthwhile. But the thought without the action is quite useless. We have heard all that before. Lip-service agreement combined with an undercurrent of obstructiveness was where we all came in on this subject—way back in 1923–26 !

SURFACE GUNNERY—THE HISTORY OF A WEAPON SYSTEM

By Lieut.-Commander J. Stewart, R.N.

THE last 20 years have seen a rapid decline in the importance of heavy guns as weapons of naval surface action. Carrier-borne aircraft replaced them as the main armament of fleets during the second World War. To-day, no important Navy keeps a battleship in operational commission and the last British armoured ships designed to carry guns as their main armament, the " Tiger "-class cruisers, are nearing completion. Plainly the long era of the shipborne gun is nearly over. We can look back over almost the whole history of this era—a rare opportunity for the study of a weapon system and its tactical employment.

The heavy gun first went to sea over 400 years ago when Henry VIII insisted on arming his ships with great ordnance. By doing so he created a new instrument of war, an instrument which changed fighting methods almost as drastically as the even more revolutionary weapons developed in recent years.

Before the heavy gun went to sea, a naval action in northern waters resolved itself into a large number of simultaneous small-scale encounters between men-at-arms. Light missile weapons, such as bows and hand-guns, were used to kill or maim the enemy as ships closed one another, but the day was decided by hand-to-hand fighting after they had grappled.

With the introduction of the heavy gun, the fire fight became the decisive phase of the battle instead of being only a preliminary to it. Instead of men fighting one another, ships, or more accurately their companies, fought other ships.

It took men many years to determine the capabilities and limitations of their new weapon, longer still to devise the proper tactics for exploiting these capabilities. Most of the earliest experience was gained against lightly built ships, such as the galleys that tried to oppose Drake's spoiling attack on Cadiz in 1587. Against such targets, heavy guns proved very destructive.

The new weapon was not put to the test of a general action between two fleets of stout, ocean-going ships until the Armada campaign. Both of the fleets then engaged carried large numbers of heavy guns, but whilst the English regarded them as their main armament; the Spaniards treated them as an auxiliary to strong detachments of veteran troops embarked as boarding parties. The English admirals knew all about those troops and the part they were intended to play. They knew, too, that if their fleet were beaten, their country would be open to invasion by the most formidable army in Europe. This made them cautious and they resolved to handle their new, almost untried, weapons with great care.

They believed, rightly, that their ships were more weatherly and more manœuvrable than the Spaniards', and that allowed them to choose the range at which to fight. Determined to take no risk of being boarded, they decided to fight at long range. But apart from their determination not to get too close to the enemy, the English had no definite tactical plan and no proper organization for battle. Their general idea seems to have been to operate in loose groups, closing to gun range in succession to fire a broadside and then retiring to reload. These tactics led to the expenditure of a great deal of ammunition for very little return. The English ships fired at such long range that they scored few hits, and even those shots that did hit struck with insufficient force to pierce enemy hulls and cause serious damage.

The Armada lost only two galleons during its passage up-Channel, both being caused by accidents and not by English gunfire. Its total reported casualties, apart from the crews of the two lost ships, were less than 500 men. It reached Calais in good order, gaining contact with Parma. Medina-Sidonia probably considered his small losses a cheap price to pay for the successful attainment of this, his first objective. He must, however, have been disturbed by his fleet's large expenditure of irreplaceable ammunition.

The English recognized that the Spaniards had done well. They realized that both their own organization and their tactics had been unsatisfactory. Their fleet had already been reorganized on a squadron basis, with command decentralized to named squadron commanders. They now appreciated that they had been fighting at much too great a range and resolved to press in closer when the battle was resumed. A night attack with fireships drove the Spaniards to sea in disorder, breaking their formation for the first time, and the English closed with them at first light as they started to re-form off the Gravelines shoals.

The Armada was desperately short of ammunition, but the Spaniards handled and fought their ships with the greatest courage, trying even harder to close and board, for they now had no other way of striking back. They did not succeed in grappling a single English ship, but did succeed, for a time, in getting back into some form of order. The cost was high. The *San Mateo* lost over half her company killed or wounded, and every galleon suffered terrible casualties among the soldiers massed in readiness for any chance of boarding. Towards the end of the afternoon, the Spanish fleet began to lose its formation, which put it at the mercy of the English, but a sudden squall of great violence intervened to save the enemy from immediate destruction. The Spaniards re-formed under cover of the squall and night fell before the English could resume the action. Being short of ammunition themselves, they never did re-engage. Instead they shepherded the Armada northwards to destruction by the elements.

What were the lessons learnt from this prolonged action? The first was that long-range gunnery was inaccurate and ineffective. The results of close-range gunfire were more complex. The guns had not proved capable of causing immediate mortal damage, they had not sunk ships, but they had crippled ships by causing so much material damage that they could no longer move or fight. Guns had also been found to be capable of causing heavy casualties. Shots at point-blank range not only pierced ships' timbers, they knocked off a shower of splinters which often killed and injured more men than the ball itself. At Gravelines, casualties were often more crippling than material damage.

No more general actions were fought by the Navy until the outbreak of the First Dutch War in 1652. Individual ships and small squadrons, however, saw some hard fighting and their experience confirmed the lessons learnt against the Armada. The last fight of the *Revenge* was a particularly interesting one. The enemy surrounded her and tried to board, but so long as the *Revenge* could keep an effective proportion of her armament in action, they were unable to do this. It was a remarkable demonstration of the dominance of the heavy gun.

As a result of all this experience it became the established doctrine of the English Navy to fight at close range, aiming their guns at their enemies' hulls with the object not of destroying their ships but of destroying their ability and will to fight by killing and wounding their crews. It was an effective method of fighting, but could be a costly one. If the enemy used the same tactics, the English crews had to bear the

losses of these bloody trials of strength more resolutely than their foes—a requirement well suited to their national temperament.

In the first half of the 17th century this method of fighting was unique to the English. Continental navies, including the Dutch, continued to rely to a great extent on boarding and the use of fireships. They seem to have regarded their guns primarily as a means of crippling their enemies by damage aloft so as to make them vulnerable to the other forms of attack.

The Development of Fleet Tactics

The problem facing English admirals at the outbreak of the First Dutch War was how to manœuvre a large fleet so as to bring individual ships into action at close range in accordance with the national gunnery doctrine. They had first, however, to master the whole art of handling large fleets for, unlike the Dutch, they and their captains were unaccustomed to operations on such a scale. This inexperience was a severe handicap in the opening battles. In the action off Portland in particular, lack of co-ordination between groups of English ships brought them close to defeat in detail by a weaker enemy.

That action taught those fine fighting men, the Generals-at-Sea, that it was essential to introduce greater order and regularity into the conduct of their fleets. They issued their Fighting Instructions to provide a common tactical doctrine. These instructions established the line ahead at half a cable interval as the principal fighting formation. This formation allows a fleet of ships carrying a broadside armament to develop its maximum fire-power. The English cannot have been entirely unfamiliar with the formation but seem to have restricted its earlier use to comparatively small numbers of ships.

The next meeting of the opposing fleets was off the Gabbard shoal. Contemporary foreign accounts lay great stress on the fact that the English spent half an hour forming their line before engaging. It was obvious that the formation was new and revolutionary to many observers. Certainly it gave the English fleet a decisive advantage over the Dutch, who fought in their usual loose groups and were demoralized by the good order of their enemies. This played a large part in their defeat.

There were at this time two schools of tactical thought in the Royal Navy. One school believed that it was essential to concentrate superior strength against some portion of the enemy fleet. They regarded the line as the essential formation for the opening phase of the action, when the admiral had to be able to control the whole fleet so as to achieve this concentration; but believed that he should use this control to force a decisive *mêlée* at close range in which the line would inevitably lose its order. They accepted that the admiral would lose some control when this happened and relied on subordinate commanders to take command of the ships near them in furtherance of the admiral's general design. The Duke of Albemarle and Prince Rupert were the leaders of this offensively minded school of thought.

What these leaders wanted to do was difficult. The mobility of fleets has always made it hard to force an enemy to fight unless both sides are seeking battle. Attempting to bring about a concentration against part of an enemy fleet has always made the problem even harder. Various manœuvres were tried during the Dutch Wars. The simplest was to mass ships in superior numbers by reducing the intervals in the line at the decisive point. The enemy could usually counter this by refusing

close action. More sophisticated methods were necessary if his ships were to be fixed and forced to fight at a disadvantage.

Two ways of doing this were devised. The first was 'doubling' on the enemy line by overlapping round one end of it, and so sandwiching his ships between two lines of gunfire. The other method was to break the enemy line by driving a line of ships through it, cutting off the ships astern of the break and throwing them into disorder.

The other school, led by Sandwich and the Duke of York, considered these aggressive tactics too dangerous. They believed that in achieving their concentration the 'mêléeists' exposed themselves to a counter concentration on their own disordered and vulnerable fleet. They considered that this was an unjustifiable risk and insisted on more formal tactics. They wished to keep control of their fleet after close action was joined, and to achieve this required their ships to keep the line throughout the battle.

Opinion swung between the ideas of the two schools as battles were fought and more experience gained. The 'mêléeists' could point to actions like Lowestoft in which an admiral of the other school kept such firm control that his fleet never became seriously engaged. The formalists replied by pointing out occasions when the *mêlée* had been to the disadvantage of the fleet which provoked it. This happened in the opening engagements of the Four Days' Fight, when Albemarle sought close action, although at a numerical disadvantage.

Both sides could make out a strong case, for both were partially right and there were always special circumstances about each action which prevented the extremists on either side from being able to point to a clear and unmistakable triumph of their ideas. The transient ascendancy of one school or the other was reflected in the Fighting Instructions issued to the fleet during this period. Although many of the articles were common to both schools of thought, other articles laid varying emphasis on the importance of keeping the line or gave instructions for special manœuvres designed to force a *mêlée*. The Dutch wars ended with the controversy unresolved.

There were only three major fleet actions during the next two wars. By chance, each of them tended to confirm the views of those officers who preferred the more formal type of battle. At both Beachy Head and Barfleur, the weaker fleet deliberately broke its line in attempting to redress the balance of strength, only to suffer defeat through a counter concentration. As a result, the Instructions issued by Rooke at the outbreak of the War of Spanish Succession reflected the views of the formalists. His fleet fought the only general action of the war in accordance with these instructions. The circumstances were unusual. The English were, for once, on the defensive; they were covering the newly captured fortress of Gibraltar. The French fleet's mission was to drive off Rooke's fleet, so that the fortress could be attacked by both land and sea.

The two fleets met off Malaga and fought for a whole day. It was a curiously indecisive action, neither side losing a ship. The fleets spent another day watching one another, then the French withdrew to Toulon. Their withdrawal turned a tactical draw into a major strategic victory, for it confirmed the capture of Gibraltar and established Britain as a Mediterranean power.

The formalists acclaimed this result as a triumph for their views and their Fighting Instructions. They ignored the exceptional circumstances of the action and saw no reason for concern in the failure to capture or destroy a single French ship. In

the normal course of events this ascendancy of the formalists would have been short-lived and unimportant. Tactical opinion, having swung to one extreme, would have swung back when the favoured tactics began to produce disappointing results, as had been happening for the past 50 years.

Unfortunately the process of development by trial and debate came to an abrupt end at this point. The main reason was lack of further action experience. Malaga was the only general action in the War of Spanish Succession and that war was followed by an unusually long period of peace. In the absence of any organization for giving officers tactical training, controversy and development ceased and British tactical doctrines became frozen in the shape they had assumed at the beginning of the 18th century.

In the meantime the nature of the Fighting Instructions was changed. Until then they had been issued by admirals in command of fleets, providing the means by which men with different temperaments and different tactical ideas could lay down how they wished battles to be fought. But now Rooke's instructions were reissued by the Admiralty as the permanent Fighting Instructions. In effect, admirals were given a standardized drill which they were required to follow in battle on pain of court-martial.

It was an unwarrantable interference with the initiative of seagoing commanders. Its effects were aggravated by the nature of the tactics insisted on in the Instructions, which embodied the views of the most extreme formalists. In actions between formed fleets of comparable strength, British fleets were required to fight in line, stretching their line length for length with that of the enemy. Breaking the line in action was forbidden, even if a ship beat her opponent out of her line, unless the whole enemy line fell into disorder. Commanders-in-Chief could use a little initiative, but this instruction ensured that their subordinates could use none at all.

The British method of fighting their guns was effective only at close range. The tactics insisted upon by the Instructions made it impossible to bring about a decisive action at that range. The insistence on keeping the line ruled out any attempt to fix part of the enemy fleet and force a *mêlée*.

While this contradiction between our gunnery doctrine and our tactics continued, the British fleet did not win a single tactical victory in any action between fleets of comparable strength. The rare victories won in this unhappy period were only gained when a British admiral assumed that the enemy was flying in disorder—a condition in which the Instructions allowed him to order a General Chase. When that order was flying British ships could take the shortest course to the enemy and engage him at close range.

The French took full advantage of the paralysis caused by the Fighting Instructions. Unlike our Navy, they encouraged the study of tactics, even giving tactical instruction to their officers. Their interest in the subject enabled them to work out an effective counter to the type of fighting imposed on the British.

French tactics were based on a gunnery doctrine entirely different to our own. Instead of using their guns to inflict crippling casualties at close range, they used them to cause crippling material damage at long range. They did this by firing high, often using chain shot to increase their chances of knocking down masts and yards. The British tactics laid down in the Fighting Instructions made it easy for the French to fight in this way. They would accept the leeward position and refuse close action by retiring downwind before the attacking British line. This condemned British fleets to an indecisive duel at long range in which our guns could cause little damage and

few casualties. Eventually many British ships would be crippled. Sometimes so many of them became unmanœuvrable that the fleet could no longer keep its formation. Fortunately, the French never tried to exploit such situations tactically. If they had switched, at such moments, from defensive to offensive tactics, they must have captured some ships. They never did this. They were always content to gather the fruits of a strategic victory; making use of their temporary command of the sea while our fleet went into its dockyards for major repairs.

It was a half-hearted way of fighting, but it did earn some remarkable strategic dividends. The action fought in Chesapeake Bay in 1781 was one of these short-term victories; and one of the most important naval actions ever fought. By crippling the British fleet, the French foiled its attempt to relieve Cornwallis's army and ensured the independence of the United States.

The long paralysing reign of the permanent Fighting Instructions was ended only a few months after the action in Chesapeake Bay. Rodney struck the death-blow in his action of the Saints. He had been trying to force an action with a French fleet for some days. The French, who planned to attack Jamaica, hoped for another limited victory to clear the British from their path. They were, for once, the windward fleet. On 12th April, 1782, Rodney succeeded in clawing his way into gunshot and the two opposing lines began to run past one another on opposite tacks.

Such an action could not have been decisive, but while it was in progress the wind veered in Rodney's favour. Instantly, he ordered his flagship to pass through the enemy line.

It must have been an electrifying moment, the Commander-in-Chief breaking his own line in flagrant disobedience of the Instructions. His fleet followed his example with enthusiasm, for his captains could see that his manœuvre could bring them the victory they had sought for so many frustrating years. The ships immediately astern of the flagship followed her through the gap she had made in the French line. The next ship ahead of the flagship broke through the line for herself, while the senior officer commanding the rear of the fleet led his ships through a third gap.

With the enemy line cut into four parts, two of which lay between groups of British ships, Rodney's fleet had achieved the *mêlée* at close range required by their gunnery doctrine. They settled down happily to batter their enemies into submission. By nightfall, five French ships, including their fleet flagship, had surrendered. Another two ships of the line were captured during the pursuit after the action.

The contrast with the results of the earlier French successes is marked. They had been content with a limited, short-term supremacy. They crippled our fleet to gain freedom to achieve some particular strategic aim, but because they failed to confirm their success by capturing the crippled ships, they condemned themselves to fighting those ships all over again as soon as they could refit. That road led them, in the end, to disaster.

The Battle of the Saints broke the malign spell of the permanent Fighting Instructions. British admirals abandoned caution and formality in favour of more dashing tactics, designed to bring their ships into action at the close ranges demanded by their gunnery doctrine. This happened at a moment when material developments had made British ships even more formidable at very close range than ever before. A new type of gun, the carronade, had been added to their armament. It was a light weapon with only a very short range, but it fired an unusually heavy shot.

Progress in yet another field made it easier for admirals to bring ships into the limited effective range of these new weapons. This was the provision, for the first time, of a proper system of signalling. Until this time British admirals could make only a small number of signals; each of which was linked to some section of the Fighting Instructions. Now, a proper code of signals was introduced, providing a large number of combinations of flag hoists, to each of which meanings could be allocated. Some of these combinations were allocated, as before, to particular manœuvres or instructions, the remainder to words or letters. Given time, any message could now be signalled.

The stage was thus set for the golden age of the sailing navy—the prolonged wars against Revolutionary and Napoleonic France. While not every meeting of the fleets during these wars was to be a sweeping victory, for some admirals were still too cautious to exploit their opportunities, they did yield a unique series of decisive victories.

The first success was won in the prolonged engagement known as the Glorious First of June, after the day on which the fighting reached its climax. In this action Lord Howe used an entirely new manœuvre to bring about a close-range *mêlée*. He delivered his attack from windward. His ships bore down on the enemy line in line abreast, almost as though they intended to turn up parallel and engage line to line in the old style. They had orders, however, to break through the enemy line and engage it from leeward. The originality of the manœuvre lay in the fact that ships were to break through individually all along the line. In the past, a succession of ships had passed through one gap.

It was not easy for individual ships to break the line; Howe did not expect many to succeed. That was what made the attack so cunning. It was calculated to bring British ships into close action along both sides of the French line, compelling some of the enemy to stand and fight. Howe estimated that he would take one French ship for every British ship that broke the line, and events proved him right.

Although Howe's manœuvre was acclaimed by the Navy, circumstances prevented it being used again for over ten years. Other methods had to be used in the three general actions won in that period.

When Sir John Jervis sighted a Spanish fleet off Cape St. Vincent in 1797, it was in disorder. The enemy were in two separate straggling groups. Jervis, although outnumbered nearly two to one, led his ships in line ahead between the two enemy groups, forcing them farther apart.

This move was successful. Jervis then ordered his fleet to tack in succession and return through the gap. The timing of this manœuvre was critical. Jervis, who was badly placed to judge the right moment, left it too late. The ships in the British rear could see that the Spaniards could unite their divided fleet before the British van could reach them.

Nelson was serving as Commodore of the third ship from the rear. He ordered her to wear out of the line and attack the main group of Spaniards to windward in a desperate attempt to delay their junction with the leeward group. As soon as he saw what was happening, Jervis ordered his rear ship to Nelson's support. The final result was a furious *mêlée* in which four ships were taken, two by Nelson at the head of a boarding party—a fine result against such odds.

Nelson's initiative in leaving the line is the outstanding feature of this battle. He would not have dared to do such a thing 20 years before. It was still a bold thing

to do in 1797, and many officers thought he should be reprimanded. Even Nelson himself was uncertain if his admiral would approve of what he had done.

In the next general action, Duncan's battle with the Dutch off Camperdown, it was the British fleet that began the battle in disorder. When he sighted the enemy, Duncan's ships were in two columns; a sailing, not a battle, formation. The Dutch were in line of battle. The two fleets were of similar strength.

Duncan saw that the shallow-draft Dutch were close to shoal water into which his own ships could not follow them. Determined not to miss this chance of bringing them to battle, he wasted no time. He did not even pause to form into a proper fighting order. He merely directed one of his columns against the enemy van and the other against the rear, ordering his ships to give mutual support as they came into action.

This was a daring attack, and anything more contrary to the cautious precepts of the permanent Fighting Instructions is hard to imagine. Duncan risked everything to bring about a pounding match at close range. It cost him heavy casualties, but it brought a decisive victory. The Dutch were forced to stand and fight, and nine of their ships were captured or destroyed.

In both these actions the British had been content to achieve a close action by the crudest methods. In the next engagement, the Battle of the Nile, their tactics were much more highly developed. Nelson revived the technique of doubling and so achieved not merely a close action but a close action in which all his ships were concentrated against only a portion of the enemy line. This was made possible by the captain of the leading ship, who saw an opening and, with that initiative which Nelson always displayed and encouraged, led the line between the enemy and the shore. When Nelson's flagship came into battle, he led the rest of the line along the seaward side of the anchored French. This placed them between two fires. It was an ideal situation for the British, for their guns could develop their full power. As a result 11 out of 13 French ships were taken or lost in an action against a similar number of British ships.

At the Nile the French were at anchor; at Trafalgar they were under way; but Nelson was again able to achieve a concentration against a portion of their line. He achieved this by a battle plan that was the ultimate expression of his genius.

It is not easy to explain his conduct of the battle. He described how he intended to fight it in a memorandum issued to the fleet before the enemy put to sea. In practice, however, the circumstances under which the battle was actually fought compelled him to introduce variations, which makes it rather difficult to see how closely he held to his plan.

Nelson considered various possibilities in his memorandum, but his main concern was with an attack from windward on an enemy in close-hauled line ahead, the situation normally confronting British admirals in actions against the French. With his ardent belief in concentration, his problem was to fix part of the enemy line and compel it to fight at a disadvantage. To do this he planned to divide his fleet into two, or in some circumstances three, divisions. The lee division was to be his main striking force. Its mission was to attack the rear of the enemy's line, engaging an inferior number of ships and forcing a close action upon them by use of Lord Howe's manœuvre. The purpose of the weather division was to contain the rest of the enemy fleet and prevent it going to the aid of the outnumbered ships being engaged by the lee division. Nelson planned to do this by first threatening the enemy van and centre

and then, when the lee division was fully engaged, by attacking the hostile fleet flagship and the ships in her vicinity to paralyse the enemy command. The weather division, like the lee, was to approach in line abreast and use Lord Howe's manœuvre when finally committed to close action. In his explanation of this plan, Nelson laid great stress on the fact that the handling of the divisions, within his general design, was to be left to the initiative of their commanders.

When contact was gained with the combined fleets of France and Spain off Cape Trafalgar, they had their base, Cadiz, under their lee. Nelson feared that they would try to refuse action and run for the shelter of their shore batteries. To prevent that he hustled his ships into action, sacrificing some of the finer details of his plan. Nelson himself commanded the weather division, Collingwood, the lee striking force. Both Admirals led their divisions, their flagships keeping all sail set. That made it impossible for ships astern to gain bearing and come into line abreast, although Collingwood did order his ships into a line of bearing.

Nelson played his part in containing the enemy van and centre with consummate skill. He steered first for the head of the enemy line, but this was a feint and as soon as the *Victory* came into gun range, he altered course to run down the enemy line until he reached Villeneuve's flagship, when he closed and attacked her.

By attacking in what was, to all intents and purposes, a line-ahead formation, the British gave the impression that they intended to break the line as Rodney had done. In fact, ships spread along the enemy line as they came up. The scrambling approach gave the action a superficial resemblance to Camperdown and concealed the subtlety of Nelson's plan. The victory was as decisive as Nelson had hoped, but a stiff price was paid for it. The attack in line ahead exposed the leading ships to a concentration of fire from several enemies, fire that would have had to be dispersed if the approach had been made in line abreast as originally intended. Nelson judged the odds correctly, but the risks he took to get into action with the minimum delay cost many lives, including his own.

Trafalgar was the last major engagement between sailing fleets at sea. Nelson's tactics made it the most decisive tactical victory ever achieved in an action in which two such fleets had freedom to manœuvre. Strange as it may seem, few of his contemporaries appreciated the brilliance of his plan. They did not understand that it had forced the enemy to stand and fight at a disadvantage. They saw the battle merely as a triumph for the principles of close action and mutual support. Perhaps they were bemused by the last-minute decision to rush into action without forming line abreast.

Their lack of understanding led them to carry the principle of close action to extremes. Not realizing how carefully tactics and gunnery methods had been matched at Trafalgar, they proceeded to sacrifice the long-range hitting power of their ships to make them even more formidable at the closest ranges. British ships were increasingly armed with carronades at the expense of conventional cannon. In training men to use the cannon that remained, great emphasis was laid on fast loading, but accuracy was neglected, because accuracy was unimportant at point-blank range.

These changes resulted in British ships being able to develop their full fighting power only at the very closest ranges. In the era of the permanent Fighting Instructions, tactics had developed without regard to gunnery policy; now, gun armaments were developed to a state where they demanded battle conditions which tactics could not always provide.

This became fully apparent in the American War of 1812. The Americans were skilled seamen and good gunners. Their seamanship often enabled them to choose the range at which to fight and they took care to choose a long range at which their accurate handling of their conventional guns, aimed low, could batter their enemies into submission while the perverted armament of the British ships could make no effective reply. It was an interesting lesson in the danger of carrying a basically sound weapon policy to an extreme.

The Development of 20th Century Navies

During the 19th century sail was replaced by steam, wood by iron and steel, and muzzle-loaders firing solid shot by shell-firing breech-loaders. These changes altered the nature of fighting ships and of navies even more drastically than the remarkable technological changes of our own times.

Change and development was so rapid that, throughout the period, ship design and construction was the dominating factor in battle and tactics became relatively unimportant. It was a foretaste of the conditions of the present day.

The balance swung violently between the means of offence and defence. Sometimes the gun was on top; sometimes the armour opposed to it. Thus, at Sinope in 1854, a Russian fleet armed with shell-guns wiped out an old-fashioned Turkish fleet; less than ten years later, the *Monitor* and *Merrimac* fought their famous duel, in which a day of hard fighting left both ships without serious damage or casualties.

By the beginning of the 20th century, the most drastic changes were complete. Development continued, but at a slower pace and along less revolutionary lines. Faced once more with the prospect of battle between ships of similar design and force, men pondered the power of their new weapons and the correct tactics for their use.

Until war broke out in 1914 most officers overestimated the power of their guns. This was not surprising. They were dealing with very powerful and exciting, if untried, weapons, which seemed able to strike blows of unprecedented violence at immense ranges. Mesmerized by such destructive power, men forgot to make proper allowance for tactical considerations.

We have seen how hard it was to force a close action on an unwilling enemy in the days of sail. Steam propulsion aggravated this difficulty by giving the weaker side greater freedom of manœuvre. The result was that most actions took the form of a chase at long range.

Guns are inherently inaccurate at extreme range. The crude equipment used to measure range and to perform fire control calculations during the first World War was equally inaccurate at such ranges.

Technical factors aggravated the difficulty of hitting. Evasive action is particularly simple and effective during a chase at long range. A simple weave makes it very difficult to keep shots in line with the target. Furthermore the pursuing ships will normally have to fire almost directly ahead with their guns at a high elevation to achieve the great range. In these circumstances a very small roll causes a large error in gun training, an error which first World War fire control equipment could not compute.

All these factors made it difficult to obtain any hits at all, and experience soon showed that a considerable number of hits were still required to ensure serious damage. Ships were built to endure punishments by opponents of their own class and, in

general, they proved able to do so. The loss of three battle-cruisers at Jutland was due to careless drill and a defect in design; it was not typical of war experience. Steel ships were, perhaps, easier to sink than wooden ones had been, but they could withstand a surprisingly large number of hits without losing the power to steam and fight.

The limitations of naval gunnery were revealed in the early actions of the war. At the Falkland Islands, two British battle-cruisers had to expend all their ammunition to sink two German heavy cruisers. At the Dogger Bank, the heavy cruiser *Blucher* was engaged by each of our battle-cruisers in turn. It took them over three hours to sink her. The lesson to be learned from these actions was that, as in the days of sail, the gun could only inflict mortal damage at short ranges, where large numbers of hits could be scored.

Although the gun was Jellicoe's chosen instrument, these lessons were ignored in the Grand Fleet. Jellicoe was oppressed by the knowledge that he could lose the war in an afternoon and his first care was to avoid defeat. Similar motives had led the formalists of the sailing era to produce the permanent Fighting Instructions, and there is a remarkable similarity between Jellicoe's methods and those prescribed in the Instructions.

Jellicoe planned to fight in line ahead in accordance with an elaborate and inflexible drill laid down in great detail in his Fleet Battle Orders. He made no provision for forcing a close action on an enemy unwilling to stand and fight. In training his fleet, he allowed subordinate commanders little initiative and he never encouraged them to exploit opportunities without reference to the fleet flagship.

To complete the resemblance to the past, the Germans, like the 18th century French Navy, had a counter to their enemy's stereotyped tactics. They had given much anxious thought to the possibility of finding themselves engaged with a superior British fleet. Their own fleet had been carefully trained to extricate itself from such a situation by turning away under cover of a torpedo attack by its flotillas. The German battle squadrons could carry out this turn away from any formation.

The manœuvre was used twice at Jutland, and since Jellicoe had resolved in advance to turn his own fleet away if threatened by torpedo attack, it extricated the Germans from danger on both occasions. After the second turn away, night fell, contact was lost, and the opportunity to destroy the High Seas Fleet was gone—and with it the last chance of saving Imperial Russia by opening the Baltic.

While Jellicoe's caution can be understood, it is surprising that he made no preparations to exploit an encounter with the enemy under conditions favourable to the British fleet. He commanded, after all, the stronger, faster, and more heavily gunned fleet, so that although the Germans could choose when to risk action, there was always a reasonable prospect that the British would enjoy a marked superiority. This was, in fact, the case at Jutland, where Jellicoe had the additional advantage of being between the Germans and their bases.

Having made proper provision for an action in which there was risk of defeat in detail, Jellicoe should surely have gone on to consider how he could annihilate an inferior enemy. To do that he would have had to solve the classic problem of forcing an unwilling opponent to stand and fight at close range. He might, rather surprisingly, have found it easier to do so than most of his predecessors.

The Grand Fleet enjoyed a general margin of speed over the Germans. Its Fifth Battle Squadron, the *Queen Elizabeths*, had a unique superiority of speed, armament, and protection, having been built to work as a detached unit capable of harassing

and delaying a retreating enemy until the main fleet came up. This unique unit fought in the opening encounters between the opposing battle-cruisers, and then tamely extended the already superior British line of battle. If the fleet had been trained in aggressive tactics, and its subordinate commanders taught to exploit opportunities, its superior strength should have won a decisive victory.

The Final Phase

Although the inaccuracy of optical rangefinders prevented any major improvement in the overall accuracy of surface gunnery systems between the wars, much effort was devoted to them. Better calculating instruments were produced, methods of fire control were improved, and, most important of all, new tactics were developed.

War experience had given officers a much more realistic knowledge of the capabilities and limitations of their weapons. They now appreciated that guns were fully effective only at close range, so they sought to devise methods of forcing an enemy to fight at these ranges.

Two lines of development were pursued. The first was based on the steadily growing power of carrier-borne air striking forces which could be used to slow down a fleeing enemy and enable the pursuing surface forces to close and destroy them. The air was, in fact, given the role the Fifth Battle Squadron might have had at Jutland.

The other line of development was based on the fact that in the days before radar, night actions were fought at very close range. At Jutland, Jellicoe had shrunk from the risks of night fighting. Now admirals determined to master this difficult art. Much arduous training made the Royal Navy efficient in night fighting and the Service adopted the policy of seeking night action.

At the outbreak of the second World War, surface armaments had similar characteristics to those they had had in 1914. It remained difficult to hit at long range, but many hits were normally needed to knock out a ship of comparable force. The *Graf Spee* action provided further proof of that.

Day action usually remained indecisive unless there was air participation; but the tactics developed between the wars proved effective. The *Bismarck* was fixed for destruction by air attack, and the long training in night fighting resulted in many successes, of which Matapan was probably the most important.

Radar rangefinding was introduced early in the war, and this corrected the greatest weakness of fire control systems. By providing a means of measuring range accurately, it greatly increased the range at which an effective number of hits could be scored.

This improvement was important, but it paled into insignificance when compared with the simultaneous improvements in the air. The range and hitting power of air strikes were increased so rapidly that they soon became the dominant arm. Fleet actions were fought by aircraft at many times the extreme range of gunnery armaments. Numerous gun-carrying capital ships were still included in fleets, but in the later stages of the war they had supporting roles, such as providing anti-aircraft guns for the close support of aircraft carriers, or naval gunfire support for ground forces.

Since the end of the war, navies have steadily reduced the number of ships armed with a main armament of anti-ship guns which they keep in service. The era of the heavy gun is almost over, leaving us a unique opportunity for the study of the relation between weapons and tactics.

THE SAN JUAN AFFAIR, 1859

By Lieut.-Colonel M. E. S. Laws, O.B.E., M.C., R.A. (Retd.), F.R.Hist.S.

In view of the importance of Anglo-American relations today, it is of interest to recall that just over a century ago war between these two Powers was only narrowly averted. For a few days, indeed, conflict seemed inevitable, and the eventual settlement of the dispute without recourse to arms was dependent entirely on the good sense of two comparatively junior officers.

In 1859 an Anglo-American Boundary Commission was at work marking the frontier between British Columbia and Washington Territory in accordance with the Treaty of Washington of 1842. The Commissioners were unable to agree on the interpretation of the Treaty so far as it related to San Juan island, immediately opposite the settlement of Victoria. The island, which had hitherto been vaguely regarded as part of the British colony of Vancouver, was largely uninhabited, though the Hudson Bay Company had a stock farm there and a number of American squatters had recently made an appearance.

The dispute originating in the Boundary Commission had been reported to the Colonial Office by Colonel James Douglas, Governor of Vancouver, in January, 1859, and there appeared to be no reason why the matter should not be handled in the normal leisurely manner between London and Washington. Then, on 26th July, 1859, without the slightest warning, Captain George Pickett, with " D " Company, 9th United States Infantry, landed on San Juan island from the U.S.S. *Massachusetts*, established a tented camp at Griffin Bay, and hoisted the American flag. On Governor Douglas's order, Mr. John F. de Courcy, a British magistrate, called on Captain Pickett, asked him by what authority he had landed his men, and threatened him with a summons for trespass! The Company Commander replied that he was carrying out the orders of his superior officer, Brigadier-General Harney, that he had brought with him a ' resident stipendiary magistrate,' and that he would give protection to American citizens who wished to settle on the island.

Mr. de Courcy reported the matter to Governor Douglas and submitted a copy of Captain Pickett's first order, which read as follows :

" Military Post, San Juan Island,
Washington Territory
July 27th, 1859

Order No. I

I. In compliance with orders and instructions from the General Commanding, a Military Post will be established on this island on whatever site the Commanding Officer may select.

II. All the inhabitants of the island are requested to report at once to the Commanding Officer in case of any incursions of the Northern Indians, so that he may take such steps as he may deem necessary to prevent any future occurrence of the same.

III. This being United States territory, no laws other than those of the United States, nor Courts except such as are held by virtue of the said laws, will be recognized or allowed on the island.

By order of Captain Pickett.
James W. Forsyth,
Second Lieutenant, 9th Inf,
Post Adjutant."

On 30th July Colonel Douglas, having failed to remove the invaders by threat of legal proceedings, conferred with the Senior Naval Officer—Captain Michael de Courcy, of H.M.S. *Pylades*—and formally requested him to despatch a warship to San Juan to prevent the arrival of more American troops and to stop those already there from erecting fortifications. As Captain Pickett's company totalled less than 70 men with three small brass guns, there did not seem much likelihood of their constructing very formidable field works. But to prevent the Americans from digging themselves in would clearly require the landing of British soldiers or sailors and the use of armed force.

Captain G. T. Phipps Hornby, H.M.S. *Tribune*, was therefore despatched to San Juan island on 31st July with orders to prevent the landing of American reinforcements and " to assist the civil power." On the same day H.M.S. *Plumper*, Captain G. H. Richards, was sent to collect troops from Queensborough and to transfer them to H.M.S. *Tribune* at San Juan. Some seven officers and 160 men of the Royal Marines had reached the colony on 13th February, and in addition there were six officers and 114 men of the Royal Engineers available. With this military backing the British naval force on the station—H.M.S. *Tribune* (31), *Satellite* (21), *Pylades* (21), and *Plumper* (12)—was clearly in a position to destroy Pickett's single infantry company if required.

Captain Phipps Hornby realized that with such overwhelming force at his disposal he could afford to act with caution without danger of his motives being misunderstood. He was also convinced that if he landed his Marines on the island as had been indirectly suggested, it would be almost impossible to avoid a clash. He therefore landed none of his men, but himself went ashore to meet Captain Pickett. Most fortunately as it turned out, the American officer was not in the camp when Phipps Hornby appeared, and by the time the meeting between the two took place, new orders had been received from Governor Douglas.

It seemed clear that the S.N.O. had at last persuaded the Governor to adopt a more moderate attitude until he could discover whether the arrival of the United States troops at San Juan had been ordered by the local military commander or at the instigation of the Washington Government. By the evening of 31st July, Captain Phipps Hornby had received new orders which required him to avoid a clash with the American forces and not to interfere with any reinforcements which might land on the island. Almost immediately after Captain Phipps Hornby had received these fresh instructions, the U.S.S. *Massachusetts* again appeared in Griffin Bay, but left again after a short stay without landing the troops she carried.

With his new orders fresh in his mind, Captain Phipps Hornby had his first meeting with Captain Pickett, whom he described as follows: " He speaks more like a Devonshire man than a Yankee. His manner is more quiet than that of most of his countrymen." The American officer explained that should he be opposed on the island he would " seize a small force, attack an equal force, and protest at a large force." The interview was friendly, and indeed cordial, both Briton and American evidently recognizing the other man's difficulties. There appears to have been a mutual agreement that everything possible should be done to avoid a conflict, and Phipps Hornby came away satisfied that Pickett would not interfere with the British subjects on the island or permit the American magistrate to do so.

Meanwhile Governor Douglas had requested Captain J. C. Prevost, of H.M.S. *Satellite*, to get in touch with his opposite number on the Boundary Commission to find out whether the occupation of San Juan had been ordered by the local military

commander on his own initiative or by the United States Government. The American Commissioner proved, however, to be a most elusive person, and Captain Prevost, having failed to find him, went to San Juan to call on Captain Pickett. When Prevost suggested that a joint military occupation of San Juan seemed a sensible solution of the immediate problem, Pickett would not officially agree, though he added that " the island was quite large enough for both." He also again made it clear that he would avoid friction with the few British inhabitants and would respect private property.

Captain Phipps Hornby, who had received a detachment of troops brought over by H.M.S. *Plumper* on 2nd August, was convinced that Pickett would co-operate in avoiding trouble, and he therefore decided not to land his Marines. His action was subsequently fully approved by Rear-Admiral R. L. Baynes, Commander-in-Chief Pacific Station, who on arrival ordered him to avoid conflict and to maintain touch with Pickett. On 13th August Lieutenant-Colonel J. S. Hawkins, R.E., one of the Commissioners, was sent off on board H.M.S. *Pylades* to San Francisco where he was to transfer to the mail steamer and carry despatches to London.

Though the immediate danger of conflict at San Juan had been averted, a further heightening of tension occurred when a reinforcement of three companies of infantry, with artillerymen and eight 32-pdr. guns, landed on the island on 13th August. Lieutenant-Colonel Casey, who commanded this force, went to Esquimalt and, with incredible lack of tact, sent a note to Admiral Baynes inviting him to a conference on board his [Casey's] ship. The invitation was politely declined, though the Admiral made it clear that he would be happy to see Colonel Casey on board his flagship.

Meanwhile the British Ambassador in Washington had received assurances that the occupation of San Juan had been ordered by Brigadier-General Harney without the prior knowledge of the American Government. Britain, still recovering from the Crimean war and the Indian Mutiny campaign, had no desire to become involved in North America, while the growing differences between North and South in the United States made the Washington Government anxious to avoid foreign adventures. Under these circumstances it was soon agreed that the American General Scott, who commanded the respect of both Governments, should be sent to investigate the matter and arrange for a joint military occupation of San Juan until the normal diplomatic machinery could be set in motion.

By 25th October General Scott had suggested to Governor Douglas that each country should keep a force of 110 men on the island in separate camps. This proposal was accepted and later confirmed by both Governments. On 5th November orders were issued for the withdrawal of all the United States troops from San Juan except one company, while the British Admiralty provided a detachment of Marines. After prolonged negotiations the British Government eventually withdrew its claim to San Juan island, probably as an inducement to the United States to accept the terms of the Alabama Arbitration.

Captain Pickett received a good deal of adulatory publicity in the United States for his firmness in carrying out his orders in the face of vastly superior force, and indeed he had clearly behaved with admirable good sense. His soldierly qualities were later shown to great advantage during the American Civil War when he commanded a division of the Confederate Army.

In England, where the true facts of the matter had not at first been clearly understood, Governor Douglas was given great credit for having handled the San

Juan affair so diplomatically. Captain Phipps Hornby in a private letter commented as follows: "That is rather good when one knows that he [Douglas] would hear of nothing but shooting them all at first, and that after all peace was only preserved by my not complying with his wishes, as I felt he was all in the wrong from the first. I got the abuse for saying that San Juan was not more our island than the Americans', and that we should be equally wrong in landing troops there, and now they find that I was right."

Perhaps the most telling evidence on this last point came from Admiral Baynes, who reported to the Admiralty that war had been averted by Captain Phipps Hornby's "good judgment in not following the Governor's instructions." In later years Captain Phipps Hornby became an Admiral of the Fleet.

Today, when Anglo-American relations have never been closer or more cordial, it is unthinkable that such a trivial affair as the occupation of San Juan island should lead to war, but a century ago the danger was very real. With the primitive means of trans-Atlantic communications then available, everything depended on the judgment of local commanders, and it was fortunate for the nations concerned that the San Juan dispute was initially handled by such men as Captain Geoffrey Phipps Hornby, R.N., and Captain George Edward Pickett, 9th U.S. Infantry.

DISENGAGEMENT

By Captain A. W. Clarke, C.B.E., D.S.O., R.N. (Retd.).

IN thinking back over the last 45 years, a consistent German naval policy of 'disengagement' emerges with startling clarity. It can be argued that strategically this was a sound concept. It was the British, and their allies, who were essentially dependent upon freedom of movement across the seas for a successful prosecution of the war. To Germany (as with Russia today) it was not a vital requirement. A strategy, therefore, of maintaining a constant threat to that dependence enforced upon Britain the need to maintain forces of sufficient strength in each and every vulnerable area to cope with sudden intrusions; enterprises which could be projected at the enemy's own selected moments.

By maintaining this constant strain upon our naval resources, there was hence justifiable German hope that weaknesses in our 'cover' could be exploited from time to time, and to a degree these did arise and advantage was taken of them with occasional considerable success. But the essence of the concept was that Germany continued to possess the means to maintain the threat. Chances which led to losses could not be taken; the fleet had to be retained 'in being.' Tactical disengagement when enemy surface forces were met with became in effect the guiding principle; and on reflection it is not apparent that the majority of German naval officers felt sufficiently free even to take a proper fighting advantage of tactical circumstances in which the odds were clearly in their favour.

Objectively, the strategic concept can be said to have been sound from the German point of view, but only if it did not undermine the essential offensive spirit. Broadly, it was just this bad effect which it appears to have had over the years upon the minds of German naval officers. This is not a reflection upon the quality of those officers, nor upon their personal bravery and patriotic purpose. It was something which was almost bound to happen if they were allowed to become obsessed with their Navy's overall numerical inferiority and were led towards a philosophy that it would always therefore be unwise voluntarily to engage in direct combat with equal or superior forces. Thus they came to accept that it was better to keep their ships in being 'to fight another day,' and to rely upon the continuing threat to exhaust British resources and force a widespread dispersal in an endeavour to meet any unexpected intrusion.

Some German warships were even designed with a greater proportion of their main armament aft. This may have encouraged a philosophy of 'tip and run.' The natural conclusion was that retiring actions were to be expected, and the captain's mental approach to his tactics would therefore be the same. Britain, on the other hand, has never built a warship to this kind of design, and where an equal balance of main armament could not be distributed forward and aft, then the preponderance of hitting power has been placed forward. The *Nelson* and *Rodney* were extreme examples of this; and the "King George V" class, the *Exeter* and *York*, and many capital ships of the first war demonstrate the same purpose. Again, when after this war it was necessary to compensate for additional topweight in our cruisers, it was one of the after turrets which was surrendered. In similar circumstances it might well be that the Germans would have removed one of the forward turrets. Hence, certainly, apart from all else, the British naval officer has been daily surrounded by clear evidence of an intention to take and keep the offensive and his outlook, both tactical and philosophical, has conformed.

In spite of pre-1914 boastful toasts to *Der Tag*, the German-adopted pattern of sea warfare soon became apparent in the first World War. With the exception of the Battle of Coronel in the earliest days—and surely no enemy in his sane senses would have refused battle in such circumstances—the sequence of events is one of persistent disengagement. The prelude to the Falkland Islands battle might well have taken a better turn for the German forces if Admiral Von Spee had pressed straight on to the anchorage where the two British battle-cruisers lay still coaling ship. He could have made their debouchment to sea extremely hazardous. In the North Sea it was British battle-cruisers who were always in hot pursuit of those of the enemy. It was British forces, large and small, who were for ever 'trailing their coats,' and it was rare for the enemy to press home any similar enterprise. These things were good for morale and must have been, if only subconsciously, bad for the enemy's.

Jutland sealed the pattern, as it were. The German High Seas Fleet was in a continual state of wilful disengagement; and it will have been of consequence to German naval outlook that in the years which followed its officers indulged in celebrations of the Skagerrak victory. This practice was a deliberate form of self-delusion that there was a victory in escape, and helped enormously to establish a policy of living to fight another day. The consequence is, more often than not, that great opportunities are lost and casualties are sustained without any measurable compensation.

With the advent of the second World War the German strategical and tactical policy seems to have been set and ingrained in the minds of officers and men; sustained indirectly by the myth that it was not the armed forces which had lost the first war but the subversive activities of others.

What would have happened if the *Graf Spee* had firmly closed our cruisers end on instead of running for it? It is suggested that at least one British cruiser would have been lost, if not two; and even if in the end the *Graf Spee* had been sunk she would have gone down with credit, and German morale would have been stimulated.

If the *Bismarck* and the *Prinz Eugen* had turned upon the two shadowing cruisers in the Denmark Straits, the ensuing events would have taken a vastly different turn. If the *Scharnhorst* had pressed straight on towards our three cruisers and the convoy off North Cape there would also be a different story to tell now. It is irrelevant that in both these latter cases the enemy might, or would, have subsequently still been intercepted by equal or superior forces and been destroyed.

The extreme example of irresolution brought about by restrictive instructions allied to the philosophy of disengagement lies in the events of 31st December, 1942, in the Barents Sea, when the markedly superior German surface force signally failed to achieve its object in circumstances where, both tactically and strategically, everything was in its favour. Though those restrictive instructions included a warning against unduly hazarding their ships (and this naturally encouraged the concept of disengagement) the immediate object was clear enough, but the German Command, admiral and captains alike, dismally disregarded the principles of war in almost every particular. On the other hand, it is generally agreed that the convoy escort and covering force applied those principles correctly in circumstances of great difficulty and to the complete discomfiture of the enemy. Not that anyone on the British side was mumbling the principles to himself at the time, or even giving them a thought. They were there instinctively, ingrained by past training and

professional upbringing and undisturbed by any thought of standing off and leaving the initiative to the enemy. In other words, the offensive spirit came naturally to the British commanders and was inhibited in the enemy's mind.

Hitler's rage over the fiasco and his orders to pay off the major surface units of the German Navy will not really have helped to change the officers' outlook. If anything, it will have confirmed the general impression that risks must not be taken, and when, as is apparent, the decision to immobilize the surface fleet was modified to the extent of retaining the *Tirpitz* and *Scharnhorst* in operational commission, both of them ultimately went to the bottom without any commensurate compensation for their loss.

At first sight the endeavours and achievements of German submarines appeared to contradict the theory put forward. There was plenty of the offensive in the make-up of their best captains (though there were others who were inclined to keep out of trouble) but at once this can be attributed to the fact that within that Service there would not have been a feeling of numerical inferiority in the manner present with their colleagues in the surface forces. In each of the two great wars, German submariners have taken immense pride in the knowledge that they were members of the greatest underwater fleet in the world, that victory depended upon the success of their efforts, and that, in their own eyes anyway, they were the cream of their Navy. All this was an immense and natural stimulant to do better and better and, incidentally, may have acted as an additional depressant on the outlook of the others.

In passing, it is suggested that the same atmosphere appears to have permeated the Italian Navy, though in a more obvious form and attributable in part to a lack of real enthusiasm for the war. From the collapse of France it possessed and held numerical naval superiority in the Mediterranean in addition to the natural gift of an ideal strategical position. History records how little opportunity was taken of these immense advantages. Japan is an example of the opposite attitude of mind. The offensive spirit burned brightly until the bitter end. Battle was never declined. It cannot be said that the Pacific sea war was lost to the Japanese because of their doctrine. They were beaten by superior American skill, aided by better equipment, married to an equal or even more determined offensive spirit; but the Japanese attitude and practice made their defeat more difficult and it took longer than would otherwise have been the case.

* * *

Up to 1939 the Royal Navy was second to none in strength and clearly superior in numbers to the navies of our potential enemies. Circumstances have now altered, at least for the time being; and in the last few years many advocates of a larger Navy have been loud in their complaint and have made much play with numerical comparisons to our disadvantage. In some respects these invidious comparisons have been overdone. Too little regard has been given to the age and future capabilities of many ships still listed as ostensibly battle-worthy; ships which, by taking the calculated risk that major war is not in the immediate offing, we have wisely disposed of as expensive and profitless encumbrances.

Be that as it may, the fact remains that for the time being the Royal Navy is numerically inferior to the Soviet in certain classes of ship and, to the profound distress also of staunch supporters of 'Britannia Rules the Waves,' inferior in every

class to the U.S. Navy. It is a circumstance which is sure to remain with us now for a time, though in this fast-moving age that waiting period is probably nothing like as long as some would pessimistically imagine.

Meanwhile, the new generation of naval officers faces a circumstance unknown to its predecessors, and the dismal outpourings of critics of Admiralty policy could have an effect upon those officers' outlook. If there is any substance in the theory that numerical inferiority can in the long run have an unfortunate psychological consequence, then our present and future naval officers must continue at all costs to be taught and assured that the principles of war, with its emphasis on offensive action, still in truth apply both strategically and tactically, whatever the circumstances. Quality, efficiency, clear thinking, and above all determination can redress the balance; and it would do no harm for those who now are only 'lookers on' to devote more attention towards encouraging their successors with expressions of confidence in their ability rather than indulging too frequently in invidious comparisons with the past.

There will be German naval officers today who must mourn over lost opportunities and the failure to take a chance for lack of the true offensive spirit at a critical moment. But they cannot really be blamed. It was endemic in their make-up. We must never allow this to happen to our officers.

THE ARMY PHYSICAL TRAINING CORPS CENTENARY : 1860–1960

By Brigadier A. E. C. Bredin, D.S.O., M.C.

THE year 1960 marks the centenary of the Army Physical Training Corps. The A.P.T.C. of today owes its beginnings to the Crimean War and the Indian Mutiny; by the end of the latter it was apparent that all was not well with the training and administration of the British Army. In order to introduce some form of fitness training, Major F. Hammersley and twelve selected non-commissioned officers (known to posterity as " the Twelve Apostles ") from various units in the Army were assembled at Aldershot in 1860, and so the Army Gymnastic Staff came into being; Major Hammersley being eventually appointed Inspector of Gymnasia with the rank of lieutenant-colonel.

Throughout its history, the Army Gymnastic Staff (which became later the Army Physical Training Corps) had much to do with encouraging and even starting many of the sports and games which flourish in the country today. For example, Colonel Hammersley was largely responsible for the formation of the Amateur Athletic Club in 1866—today's Amateur Athletic Association—and he became its first Chairman. He was also interested in the National Olympic Association, formed to control all athletic bodies in Great Britain, to whom we are indebted for the Corps motto " Mens sana in corpore sano."

The early training aimed at developing muscular strength, the result being a bulging torso with comparatively inadequate under-pins. Harmonious development was to come later. In 1865, the first physical training regulations were published; physical training was to take precedence over all other forms of training during the first two months of a recruit's service, while the trained soldier was to undergo a three months' annual course. Those showing special aptitude were selected for a further course at the Headquarters Gymnasium at Aldershot, and so we had the earliest Regimental assistant instructors. The best of the latter were selected for service with the Gymnastic Staff. The object of the training at that period was: " The strengthening of the soldier so that he can cover 1,000 yards or more, at a rapid pace and at the end be capable of using his bayonet effectively." Among the equipment used were dumb-bells, bar-bells, climbing ropes, horizontal bars, swinging trapeze, vaulting horses, climbing walls, and high-balancing planks. Cross-country work was also included, while fencing was compulsory for the cavalry.

The development of physical education in Scandinavia did not pass unnoticed; and the then Inspector of Gymnasia (Lieut.-Colonel W. B. G. Cleather) took a party of instructors to Sweden in 1882 to study the national system there. New systems were not, however, popular with the Army authorities at that period, though a few innovations such as physical drill with arms and exercises performed to music were allowed. Another abortive trip to Sweden, led by Colonel G. M. Fox, followed in 1890; but it was not until 1906 that the system advocated by Lieutenant Lankildd of the Danish Army was allowed by the authorities to be introduced. Up to that time, though the training facilities for the soldier had been improving, including the building of depot gymnasia all over the country, very little advance had been made in the actual physical training. In the event, the new system was warmly welcomed by high-ranking Army officers, medical officers, and professors of anatomy, and in 1908 the official manual of Physical Training was produced.

Meanwhile boxing had been regarded as a useful means of training, and the first boxing championships were held at Aldershot in 1893. Official recognition was given in 1907 to the introduction of boxing instruction into the training programme, thanks largely to the efforts of Colonel V. A. Couper (Inspector, 1910–1914); the latter was also largely instrumental in bringing the methods of bayonet fighting up to date.

The physical training of the Army carried out by the Army Gymnastic Staff was to bear fruit in the first World War, to mention only the fitness of the 'Old Contemptibles' of 1914. Bayonet fighting became the responsibility of the Gymnastic Staff and Command Schools were started to train instructors for the great new armies. In 1916, Major (later Lieut.-Colonel) R. B. Campbell (Inspector, 1918–1923), the author of *The Spirit of the Bayonet*, established the first overseas school for physical and bayonet training at Flixecourt and later at St. Pol. It is recorded that Sgt. Wilcox, who afterwards served on the staff at St. Pol, killed eighteen Germans with the bayonet at the first battle of Ypres, being awarded the D.C.M. Instructors were sent to all the principal theatres, where schools and training centres were set up; some instructors were even sent to the U.S.A. where they won excellent opinions. The scope of the training carried out by the Gymnastic Staff during the war included developing the physical efficiency of young recruits, restoring war-worn men by physical training and games, the exercise of trained soldiers, remedial and reconditioning work in hospitals and convalescent depots, and sustaining the spirit and morale of the Army by bayonet training and boxing.

It was at a conference held at the Army School of Physical Training in 1922 that certain resolutions were taken, which have since, in the main, been adopted. These included the standardization of physical training as to system, words of command, and basic exercises. Between the wars, too, physical training was thoroughly reorganized for the Army in India and a study was made of physical training methods in other countries. In particular, Major (later Brigadier and Inspector, 1939–1944) T. H. Wand-Tetley established a close liaison with the Danish School at Ollerup; and, incorporating the outside knowledge gained, a new manual of Physical Training was introduced in 1931, followed by a further publication in 1936.

With the threat of a second World War looming up the whole physical training system was completely overhauled. Recruits' training tables were revised and new tables for trained soldiers and enlisted boys were produced. There was considerable building activity at Aldershot. Hammersley Barracks, the Brown Gymnasium, and the modern designed Wand-Tetley Gymnasium were completed between 1935 and 1939. Just in time. Owing to the comparatively low physical standard of over half of those voluntarily presenting themselves for service, a specially designed course of remedial and conditioning training was introduced with great success; and the first Recruits' Physical Development Depot was opened at Canterbury.

As before, the outbreak of the second World War found the low strength of the Army Physical Training Staff inadequate to deal with the rapid growth of the Army. In order to help expand the staff quickly to deal with the increased commitments, Regimental assistant instructors, schoolmasters, well-known athletes and games players, sports coaches, and others with a knowledge of physical training methods were taken in at the School and trained as Staff Instructors. Command Schools were rapidly expanded and staff instructors posted to the B.E.F. After Dunkirk it was decided that the staff should be formed into a Combatant Corps, with Headquarters at Aldershot; and on 16th September, 1940, the Army Physical Training Corps came into being.

The main theme of the wartime physical training was its purposefulness and its relation to battle conditions; lessons on close combat were revised and battle dress and equipment were worn whenever it was practical. Every instructor of the Corps itself had to be fit to fight in every sense of the expression. Outdoor apparatus appeared in bigger and more varied quantities; and we saw the introduction of tubular scaffolding, obstacle courses, and the "Trainasium." The techniques of gun man-handling, leg exercises for toughening, climbing, and scaling, synthetic parachute training, battle swimming—all found their way into the curriculum. Special techniques were used with good effect in preparing the troops for the battle of Alamein, and tough tactics teams were organized and attached to field units. Para-trained Corps instructors jumped at Arnhem with the men they had helped to train. Of the Corps, throughout the war, 83 were decorated or mentioned in despatches and 33 were killed in action or died on active service.

In 1946, H.M. King George VI approved the appointment of a Colonel-Commandant of the Corps, and Field-Marshal Viscount Montgomery of Alamein was appointed. It will be appropriate to conclude with a quotation from the Colonel-Commandant's foreword to the Centenary brochure: "... a Corps which has the highest standards of discipline and devotion to duty ... the task is to make the Army physically fit to stand up to the stresses and strains of modern war, and to develop in them those powers of discipline and endurance which enable the British soldier to fight on when conditions are almost unendurable—and finally to conquer ... it is the same in peace. The soldier must at all times be physically and mentally fit to answer the calls of the Army in many parts of the world ... the Field Army would never want to be without its attached instructors from the A.P T.C."

CORRESPONDENCE

(Correspondence is invited on subjects which have been dealt with in the JOURNAL, *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.)

To the Editor of the R.U.S.I. JOURNAL

SIR,—It must surely be as important in a cold or ideological war as in a shooting war to have an aim, expressible in simple terms, to which to relate your strategy and your tactical planning. In the contest with Communism which is being fought on every continent we know the enemy's aim. It has been restated recently by Mr. Khruschev—that the red flag shall fly over the world in his life-time.

What is ours? Have we an aim adequate to sustain and inspire us and our allies? Or is it only to protect our way of life, to guard the *status quo*?

In a changing world this is not good enough. It is defensive, negative, not fully accepted in the West, and largely unacceptable in the uncommitted countries. And not all of our way of life is worth keeping anyway!

We are not winning the cold war at present, and a major factor in our failure was stated recently by Sir Anthony Eden to be our inability to find unity with our allies in planning. But surely this in turn is due to the fact that we are without an adequate aim, for the basis of planning must be the aim, and effective planning is only possible when the aim is rightly chosen and appreciated.

" If the bugle sound an uncertain note . . . " When we and our allies find and accept an adequate aim, we shall also find unity in planning. We shall see our problems in a new light and our enemies will not find it so easy to divide us and to sell us such slogans as " better red than dead "—" boycott South Africa "—" keep Germany divided "—" damn those Yanks ".

We need to find an aim that is more than to guard what we have. It must be practical, it must work better than Communism, and I believe that it will lie more in the realm of the spirit than of the material.

T. C. TRAILL,
Air Vice-Marshal (Retd.).

28th September, 1960.

THE ROYAL NAVY TO-DAY

SIR,—Whilst I am deeply appreciative of the kind reception given to my book *The Royal Navy To-day* in the August number of the R.U.S.I. JOURNAL, by your reviewer, I must join issue with him over my alleged ' blunder ' regarding the comparative size of the Royal Navy today. To begin with I did not say that " the Navy today is *weaker* than it has been for over 300 years " but " Although the Royal Navy is *smaller* today than at any time during the last 300 years . . . ", and I stand by that statement.

The only comparison that can be made over such a long period of time is the number of ships in commission and not the personnel strength, because a ship whether manned by 200 men or 2,000 is still only one ship. If therefore we take the former as our yard stick we find:—

(*a*) In 1673 there were 170 ships in commission

(*b*) In 1793 there were 95 line of battleships in commission besides a large number of cruisers, and frigates.

(*c*) In 1880 we adopted the two power standard and built a navy equal to the combined navies of France and Russia.

(*d*) In 1909 we had 518 ships in commission, comprising 61 battleships, 111 cruisers, 281 destroyers and torpedo boats, and 65 submarines.

(*e*) In 1960 we have 147 ships in commission, not counting the 42 engaged in trials and training, comprising 4 carriers, 1 commando carrier, 5 cruisers, 20 destroyers, 34 frigates, 2 despatch vessels, 1 minelayer, 1 ice patrol ship, 31 submarines, 37 minesweepers, 4 coastal craft, and 7 landing vessels.

Even if we do take the personnel strength into account, we find that although the total strength today is 98,400, of that number only about 35,000 are at sea compared with 42,000 in 1693.

I could wish indeed, Sir, that I were wrong.

B. B. SCHOFIELD,
Vice-Admiral.

9th September, 1960.

GENERAL GEORGE MARSHALL

SIR,—I am interested in getting information, photographs, letters, and papers relating to the career of General George C. Marshall for use in his authorized biography which I am now writing.

FORREST C. POGUE, *Director*,
George C. Marshall Research Center,
Box 831, Lexington, Virginia, U.S.A.

22nd August, 1960.

NAVY NOTES

GREAT BRITAIN

H.M. The Queen

Aides-de-Camp.—Admiral Sir Caspar John, G.C.B., has been appointed First and Principal Naval Aide-de-Camp to The Queen, to date 17th August, 1960, in succession to Admiral Sir William Davis, G.C.B., D.S.O.

The following officers have been appointed Naval Aides-de-Camp to The Queen from 7th July, 1960, in succession to the officers stated:—

Captain M. F. Andrew, O.B.E., in succession to Captain A. H. F. Hunt; Captain H. N. C. Willmott, D.S.O., D.S.C., in succession to Captain C. P. Coke, D.S.O.; Commodore R. W. F. Northcott, C.B.E., D.S.O., in succession to Captain N. W. Fisher, O.B.E.; Captain K. Williamson, D.S.O., in succession to Captain M. K. Cavenagh-Mainwaring, D.S.O.; Captain J. Howson, D.S.C., in succession to Rear-Admiral E. G. Irving, O.B.E.; Captain M. L. Hardie, D.S.C., in succession to Captain P. M. B. Chavasse, D.S.C.; Commodore G. F. M. Best, in succession to Captain N. J. Wagstaff; Captain B. C. Durant, D.S.O., D.S.C., in succession to Captain C. B. Brooke; Captain G. H. Ashby, O.B.E., in succession to Captain A. G. Sowman; Captain W. A. Stewart, O.B.E., in succession to Captain A. B. Chibnall; Captain K. M. Symonds, D.S.C., in succession to Captain W. L. G. Porter.

Colonel R. D. Houghton, O.B.E., M.C., has been appointed a Royal Marine Aide-de-Camp to The Queen, in succession to Colonel H. F. C. Kimpton, C.B.E., from 29th September, 1960.

Honorary Surgeon.—Surgeon Captain J. A. Shepherd, V.R.D., R.N.R., has been appointed an Honorary Surgeon to The Queen, in succession to Surgeon Captain K. W. Martin, V.R.D., R.N.R., from 30th June, 1960.

Honorary Physician.—Surgeon Captain J. H. Nicolson has been appointed an Honorary Physician to The Queen, in succession to Surgeon Captain J. C. Gent, from 2nd July, 1960.

Flag Appointments

Chief Naval Engineer Officer.—Vice-Admiral R. T. Sanders, C.B., to be Chief Naval Engineer Officer in succession to Vice-Admiral Sir Norman Dalton, K.C.B., O.B.E. (October, 1960). Vice-Admiral Sanders to continue to hold his present appointment as Director-General, Dockyards and Maintenance, in addition to the appointment of Chief Naval Engineer Officer.

Electrical Engineering.—Rear-Admiral W. W. H. Ash to be Deputy Director of the Electrical Engineering Division (S) of the Ship Department, Admiralty, in succession to Mr. J. C. Thompson, C.B.E. (1st November, 1960).

Portsmouth.—Rear-Admiral G. B. Teale, C.B.E., to be Chief Staff Officer (Administration) on the Staff of the Commander-in-Chief, Portsmouth, in succession to Rear-Admiral R. W. Paffard, C.B., C.B.E. (August, 1960).

Marine Engineering.—Captain (Acting Rear-Admiral) R. S. Hawkins to be promoted to Rear-Admiral to date 7th January, 1961, and to be Director of the Marine Engineering Division of the Ship Department, Admiralty, in succession to Rear-Admiral W. F. B. Lane, C.B., D.S.C. (7th January, 1961).

Naval Education.—Instructor Captain C. R. Darlington to be promoted to Instructor Rear-Admiral and to be Director of the Naval Education Service in succession to Instructor Rear-Admiral Sir John Fleming, K.B.E., D.S.C. (3rd October, 1960).

Retirements and Promotions

Admiral Sir Gerald V. Gladstone, G.B.E., K.C.B., placed on the Retired List (22nd July, 1960).

Acting Admiral Sir Manley L. Power, K.C.B., C.B.E., D.S.O., promoted to Admiral (22nd July, 1960).

Rear-Admiral R. A. Ewing, C.B., D.S.C., promoted to Vice-Admiral (22nd July, 1960).

Rear-Admiral A. S. Bolt, C.B., D.S.O., D.S.C., placed on the Retired List (10th August, 1960).

Admiral of the Fleet Sir Charles Lambe, G.C.B., C.V.O., placed on the unemployed list (22nd August, 1960). (Sir Charles Lambe died on 29th August.)

Vice-Admiral Sir David Luce, K.C.B., D.S.O., O.B.E., promoted to Admiral (22nd August, 1960).

Rear-Admiral H. C. D. MacLean, C.B., D.S.C., promoted to Vice-Admiral (22nd August, 1960).

Rear-Admiral R. W. Paffard, C.B., C.B.E., placed on the Retired List (6th September, 1960).

Surgeon Captain (D) W. Holgate, O.B.E., Q.H.D.S., promoted to Surgeon Rear-Admiral (D) (19th September, 1960).

Exercises and Cruises

"Fallex 60."—The N.A.T.O. exercise "Fallex 60" began on 20th September and continued until 1st October. About 150 ships and 400 aircraft manned by over 40,000 men took part, and the exercise covered an area extending from Gibraltar to Norway. The British contribution amounted to 29 ships, including the aircraft carriers *Ark Royal* and *Hermes*. Two of the American submarines, the *Scorpion* and *Triton*, were nuclear-powered.

Leningrad Visit.—The first visit to a Russian port for five years by a ship of the Royal Navy took place in July, when the fast minelayer *Apollo* arrived at Leningrad on the 21st for a three-day call. The *Apollo* brought back to Portsmouth the British Council's exhibition of 141 British paintings, lent by 66 museums and private owners, which had been on display in Moscow and Leningrad.

Fishery Squadron.—Following the voluntary ban on fishing within the disputed limits off Iceland, the Fishery Protection Squadron was able to visit Grimsby in force from 21st to 23rd July to accept the Freedom of the Borough conferred by the Borough Council in recognition of the long and happy association between the ships and the Grimsby fishermen. The Squadron consisted of the frigates *Duncan, Malcolm, Russell,* and *Palliser;* the coastal minesweepers *Soberton, Belton, Wasperton,* and *Wotton;* and the inshore minesweepers *Squirrel* and *Watchful.*

Channel Survey.—Following the entry of large deep draught tankers into service, a special survey is being made of the eastern part of the English Channel, roughly between Dover and Dungeness, in which about a hundred war wrecks were known to have littered the seabed. The R.N. Wreck Dispersal Fleet before it was disbanded in 1958 checked the depths of these wrecks to give a minimum clearance of at least 45 feet, but a depth of 60 feet is now considered the safe limit. The surveying ship *Scott* has been engaged in this work.

Mediterranean.—On 15th June, units of the Mediterranean Fleet joined the U.S. Sixth Fleet for three days of anti-submarine and air defence exercises in the Western Mediterranean known as "Royal Flush." An opportunity was provided for H.M.S. *Ark Royal* to operate with the U.S. carriers *Forrestal* and *Roosevelt.*

Nigeria.—The cruiser *Bermuda* left Devonport on 16th September for Lagos to take part in the celebrations of Nigeria Independence Day on 1st October, conveying six representatives of the Nigerian community in London as guests. From 28th September to 4th October, while at Lagos, she flew the flag of Vice-Admiral Sir Dymock Watson, Commander-in-Chief, South Atlantic and South America.

FAR EAST.—On the conclusion of exercise " Sealion " in May, a major part of the Far East Fleet left Singapore for a cruise to Hong Kong, Korea and Japan. Eighteen ships of the Fleet concentrated in Singapore waters early in August for exercise " Fotex," conducted by the new Second-in-Command, Rear-Admiral M. Le Fanu.

PERSONNEL

SHORT SERVICE COMMISSIONS.—It was announced on 9th August that as part of the new career structure of the Royal Navy, first announced in 1956, a limited number of Short Service Commissions in the seaman specialization is now being awarded to suitably qualified young men between the ages of 17 and 23, including ratings in the Fleet, some R.N.R. officers, and boys who cannot quite attain the academic standards required for the General List. In the main these officers will be employed on general seaman duties in all classes of ships, including submarines. Successful candidates will be entered as cadets. On completion of initial training at the Britannia Royal Naval College, Dartmouth, they will be appointed midshipmen for twelve months' training at sea. Permanent Commissions on the Supplementary List will be awarded to a proportion on completing eight years' service. On leaving the Active List on completion of ten years, officers will be eligible for a tax-free gratuity of £1,550. Officers who leave on completion of five years will be eligible for a tax-free gratuity of £775. Regulations and application forms may be obtained from the Officer Entry Section, Room 751, Queen Anne's Mansions, St. James's Park, S.W.1.

H.M.S. " DISCOVERY."—Captain Scott's Antarctic ship, now H.M.S. *Discovery*, returned to the Victoria Embankment on 4th August after refit at Chatham, and a month later began duty in her new role as Recruiting Headquarters for the London Area. She continues to be the flagship of the Admiral Commanding Reserves.

MATERIEL AND DOCKYARDS

COMPLETIONS.—H.M.S. *Lion*, second of the " Tiger " class of cruisers, commissioned for service on 20th July at the Wallsend-on-Tyne shipyard of Swan Hunter and Wigham Richardson, Ltd. Launched in September, 1944, fitting out was stopped in 1946 and all work suspended until 1954, when a fresh contract for completion was agreed.

H.M.S. *Lincoln*, fourth of the "Salisbury " class of aircraft direction frigates, was accepted from her builders the Fairfield Shipbuilding and Engineering Company, Ltd., at their Govan shipyard on 7th July.

H.M.S. *Londonderry*, anti-submarine frigate, was provisionally accepted into service on 22nd July from her builders, J. Samuel White and Company, Ltd., at Cowes.

H.M. Submarine *Finwhale*, sixth of the " Porpoise " class, was accepted on 19th August, after completion by Cammell Laird and Company, Ltd., Birkenhead.

H.M.S. *Brave Swordsman*, second of the " Brave " class of fast patrol boats, was handed over by her builders, Vosper, Ltd., of Portsmouth, for service on 20th July.

H.M.S. *Layburn*, boom defence vessel, the second of her class, was accepted from her builders, Simons-Lobnitz, Ltd., at Renfrew on 7th July. She will operate from Malta.

LAUNCHES.—H.M.S. *Gurkha* was launched at the yard of John I. Thornycroft and Company, Ltd., Southampton, on 11th July. H.M.S. *Nubian* was launched at Portsmouth Dockyard on 6th September. H.M.S. *Tartar* was launched at Devonport Dockyard on 19th September. These are the second, third, and fourth ships respectively of the " Tribal " class of general purpose frigates.

H.M. Submarine *Onslaught*, third of the " Oberon " class, was launched at Chatham Dockyard on 24th September.

SECOND NUCLEAR SUBMARINE.—It was announced on 31st August that the terms of a contract for a second nuclear-powered submarine had been settled and the ship-builders, Vickers-Armstrongs, Ltd., had been authorised to put the work in hand. The

principal sub-contractors will be Vickers-Armstrongs (Engineers) Ltd., for the machinery and its installation, and Messrs. Rolls Royce and Associates for the steam raising plant.

H.M.S. *Vanguard*.—The last battleship in the Royal Navy, H.M.S. *Vanguard*, left Portsmouth on 4th August under tow for Faslane, in the Gareloch, to be broken up.

Portland Amalgamation.—The Underwater Weapons Establishment and the Underwater Detection Establishment, both at Portland, have been amalgamated for purposes of research and development with effect from 1st October, 1960, and will be known as the Admiralty Underwater Weapons Establishment.

Fleet Air Arm

Strike Aircraft Named.—The N.A. 39 strike aircraft, a two-seat all-weather aircraft powered by two de Havilland Gyron Junior engines and built by Blackburn Aircraft, Ltd., has been named the Buccaneer. One of many interesting features is its large bomb bay with a rotating bomb door. It can carry a wide variety of weapons and equipment and can be adapted for use as a flight refuelling tanker and a photographic reconnaissance aircraft.

Royal Naval Reserve

R.N.V.S.R. Entries.—The Admiralty drive for direct entry officer candidates for the Royal Naval Volunteer Supplementary Reserve is being intensified. The Admiral Commanding Reserves has sent a personal letter to over 600 yacht clubs and to universities and technical colleges with full details of the scheme under which young men, preferably between 20 and 30 and with an interest in the sea, can qualify for dormant commissions in the Royal Naval Reserve. At present the R.N.V.S.R. consists largely of veteran wartime R.N.V.R. officers. The aim is to prune the present membership and strengthen the Reserve with the introduction of younger blood to the 32 flotillas and units organized throughout the country. Those interested should apply in writing to the Secretary of the Admiralty.

Royal Marines

Commandant General.—Lieutenant-General Sir Ian H. Riches, Commandant General, during the autumn visited all establishments and units in this country. On 1st September, during Exercise "Dummy Run" on Dartmoor, he handed to the Commanding Officer, 41 Commando, the Unit Presidential Citation which was awarded for its actions in Korea in 1950.

Appointments.—Major-General R. C. de M. Leathes, C.B., M.V.O., O.B.E., to be Major-General, Royal Marines, Portsmouth, in succession to Major-General R. W. Madoc, C.B., D.S.O., O.B.E., with effect from 9th January, 1960. Colonel (Acting Brigadier) N. H. Tailyour, D.S.O., was appointed Commander, 3rd Commando Brigade, R.M., on 13th September, 1960.

Corps Commissions.—Revised conditions were announced by the Admiralty on 29th August for Royal Marines Corps commissions. Age limits have been lowered—in future men can be selected between the ages of 17 years 6 months and 21 years—and the scheme provides facilities for them to qualify educationally. Corps commissions, R.M., were introduced in 1918.

Reserve Training.—Officers and men of the Commando Wing, City of London R.M. Forces Volunteer Reserve Unit, underwent their annual training this year in Belgium as guests of the Belgian Para-Commando Regiment at Le Centre D'Entrainement Commando, Marche-les-Dames, near Namur.

H.M.S. Lion Presentation.—At a ceremony on board H.M.S. *Lion* on 3rd September in Portsmouth Dockyard, the Commandant General presented the Commanding Officer Captain J.E. Scotland, D.S.O., with a memorial plaque, framed in silver, containing a copy of the citation of the award of the Victoria Cross (posthumous) to Major F. J. W. Harvey, R.M.L.I., in 1916. This officer commanded the Royal Marines detachment in the battle cruiser *Lion* at Jutland, and whilst mortally wounded after the explosion of

an enemy shell in 'Q' gun house, with great presence of mind and devotion to duty, ordered the magazine to be flooded, thereby saving the ship. His son, Lieutenant-Colonel J. M. Harvey, The King's Regiment, was unfortunately unable to attend the ceremony, but kindly lent his father's Cross for display.

CANADA

ANTI-SUBMARINE STUDY.—The Canadian House of Commons Committee on Defence Expenditure has recommended an intensive study of the advantages of Canada acquiring her own submarines for anti-submarine training and operations. At present, submarines are lent by the Royal Navy as required.

INDIA

300 SQUADRON.—The formal commissioning ceremony of No. 300 Squadron, Indian Navy, took place at the R.N. Air Station, Brawdy, on 7th July, in the presence of the High Commissioner for India. The squadron consists of Sea Hawk aircraft, and after a period of working up at Brawdy will be ready to embark in India's first aircraft carrier, the *Hercules*, which is at present being modernised in the United Kingdom. The squadron will be manned and maintained entirely by Indian naval officers and ratings, after training in R.N. establishments, and commanded by Lieutenant-Commander B. D. Law, I.N.

FOREIGN

ITALY

OFFICIAL VISIT.—Admiral C. Pecori Giraldi, Italian Chief of Naval Staff, made an official visit to the United Kingdom from 27th to 30th September at the invitation of the Board of Admiralty. His programme included calls and discussions at the Admiralty and a day's visit to ships and establishments in the Portsmouth Command.

JAPAN

OFFICIAL VISIT.—Admiral Mitsugu Ihara, Chief of Maritime Staff, Japanese Defence Agency, made an official visit to the United Kingdom from 5th to 9th July at the invitation of the Board of Admiralty. His programme included calls on and talks at the Admiralty and visits to the Royal Naval Colleges at Greenwich and Dartmouth and to the Portsmouth Command.

POLAND

VISIT TO PORTSMOUTH.—Three vessels of the Polish Navy, under the command of Commander Mielczarek, visited Portsmouth in September. They were the destroyer *Wicher* and minesweepers *Bobr* and *Mors*. Their arrival on 9th September occurred a day late owing to engine trouble in the *Wicher*, but they remained until a later hour on the 13th to make up for time lost.

UNITED STATES

FIRST NUCLEAR CARRIER.—The first nuclear powered aircraft carrier, the U.S.S. *Enterprise*, was launched at Newport News, Virginia, on 25th September. She has a length of 1,101 feet and will displace 85,350 tons. The estimated cost is 375m. dollars (about £134 m.). In an address at the ceremony Admiral Arleigh Burke, Chief of Naval Operations, said the ship's eight nuclear reactors would enable her to cruise 20 times round the world without refuelling.

NEW POLAR ROUTE.—A new polar route was opened up between 15th and 21st August by the U.S. nuclear submarine *Seadragon* from Baffin Bay to the Beaufort Sea north of Alaska. The McClure Strait, which she traversed submerged, was the new section of this North-West Passage, parts of which had been negotiated only five times by surface ships. It is thought that the route may some day become an alternative to the Panama Canal as a passage between the Atlantic and Pacific Oceans.

ARMY NOTES

GREAT BRITAIN

H.M. The Queen

The Queen, Captain-General of the Combined Cadet Force, accompanied by the Duke of Edinburgh, Colonel-in-Chief of the Army Cadet Force, reviewed the Centenary Parade of the Cadet Forces in the Garden of Buckingham Palace on 22nd July.

The Queen presented new Colours to the 4th (Carmarthenshire), 5th and 6th (Glamorgan) Battalions, The Welch Regiment, at Bute Park on 6th August.

Queen Elizabeth the Queen Mother, Colonel-in-Chief the 9th Queen's Royal Lancers, visited the Regiment at Perham Down on 23rd July, and presented the Guidon.

Queen Elizabeth the Queen Mother, Colonel-in-Chief, The Black Watch (Royal Highland Regiment), inspected the Parade and took the Salute at the March Past of the 4th/6th Battalion, The Black Watch, T.A., on the conclusion of the Battalion's march from Cortachy to Birkhall on 4th September.

The Princess Royal, Colonel-in-Chief The Royal Scots (The Royal Regiment), received the Freedom of the Royal Burgh of Linlithgow on behalf of the Regiment on 14th August.

The Queen has been graciously pleased to approve the following appointments:—

H.M. Queen Elizabeth the Queen Mother as Colonel-in-Chief 9th/12th Royal Lancers (Prince of Wales's), on formation (11th September, 1960)

To be Aide-de-Camp (General) to The Queen.—General Sir Cecil Sugden, G.B.E., K.C.B. (1st September, 1960), vice Field-Marshal Sir Francis Festing, G.C.B., K.B.E., D.S.O., promoted.

To be Aides-de-Camp to The Queen.—Lieut.-Colonel and Bt. Colonel B. H. Parker, O.B.E., D.C.M., T.D. (2nd May, 1960) ; Colonel E. L. Butler, O.B.E., M.C., T.D. (25th July, 1960), vice Colonel Sir Douglas Branson, K.B.E., C.B., D.S.O., M.C., D.L., tenure expired.

To be Honorary Surgeon to The Queen.—Colonel (Temporary Brigadier) R. A. Stephen, C.B.E., M.D., F.R.C.S. (6th August, 1960), vice Major-General P. F. Palmer, C.B., O.B.E., M.B., D.P.H., retired.

To be Honorary Physician to The Queen.—Colonel E. G. Grey-Turner, M.C., T.D., M.A., M.R.C.S. (29th July, 1960), vice Colonel G. M. Warrack, D.S.O., O.B.E., T.D., L.R.C.S., L.R.C.P., tenure expired.

To be Honorary Nursing Sister to The Queen.—Brigadier Florence B. Cozens, R.R.C. (23rd July, 1960), vice Brigadier Dame Monica Johnson, D.B.E., R.R.C., retired.

H.M. Tower of London.—Lieut.-General Sir Roger Bower, K.C.B., K.B.E., appointed Lieutenant (13th September, 1960), vice Lieut.-General Sir Euan A. B. Miller, K.C.B., K.B.E., D.S.O., M.C.

To be Colonels Commandant.—Of the Royal Regiment of Artillery, Major-General G. H. Inglis, C.B., C.B.E. (14th September, 1960), vice Lieut.-General Sir Philip Balfour, K.B.E., C.B., M.C., tenure expired, and Major-General C. J. G. Dalton, C.B., C.B.E. (25th September, 1960), vice Major-General E. B. de Fonblanque, C.B., C.B.E., D.S.O., tenure expired; of the Royal Corps of Signals, Major-General R. J. Moberly, C.B., M.C., (18th September, 1960), vice Major-General C. M. F. White, C.B., C.B.E., D.S.O., tenure expired; of the Royal Army Pay Corps, Major General Sir Owen Rooney, K.B.E., C.B. (23rd September, 1960), vice Major-General Sir Peter Bednall, K.B.E., C.B., M.C., tenure expired.

To be Colonels of Regiments.—Of the 9th/12th Lancers (Prince of Wales's), on formation, General Sir Richard McCreery, G.C.B., K.B.E., D.S.O., M.C. (11th September, 1960) ; of the King's Own Yorkshire Light Infantry, Lieut.-General Sir Roger

Bower, K.C.B., K.B.E. (1st August, 1960), vice Lieut.-General Sir Harold Redman, K.C.B., C.B.E., tenure expired; of The Royal Inniskilling Fusiliers, Major-General D. G. Moore, C.B. (1st September, 1960), vice Colonel (Honorary Brigadier) E. E. J. Moore, D.S.O., tenure expired.

Appointments

War Office.—The Reverend I. D. Neill, O.B.E., M.A., appointed Chaplain-General to the Forces (11th June, 1960). Substituted for the notification in the May, 1960, Journal.

Major-General C. L. Richardson, C.B., C.B.E., D.S.O., appointed Director of Combat Development (7th July, 1960).

Major-General C. M. F. Deakin, C.B.E., appointed Director, Territorial Army, Cadets, and Home Guard (20th August, 1960).

Major-General D. G. Moore, C.B., appointed Director of Equipment Policy (September, 1960).

The Reverend E. V. Stevens appointed Principal Roman Catholic Chaplain to the Army (16th November, 1960).

Major-General K. T. Darling, C.B., C.B.E., D.S.O., appointed Director of Infantry (late 1960).

Brigadier C. T. D. Lindsay, appointed Director-General of Artillery, with the temporary rank of Major-General (January, 1961).

Major-General R. G. S. Hobbs, C.B., D.S.O., O.B.E., appointed President, Regular Commissions Board (March, 1961).

Brigadier R. H. Farrant appointed Vice President, Ordnance Board, with the temporary rank of Major-General (March, 1961).

Brigadier W. M. Hutton, C.B.E., D.S.O., M.C., appointed Director, General Fighting Vehicles, with the temporary rank of Major-General (early 1961).

United Kingdom — Major-General R. B. Stockdale, O.B.E. B.Sc. (Eng.), M.I.Mech.E., appointed Commandant, Technical Group, R.E.M.E. (5th May, 1960).

Brigadier R. G. F. Frisby, C.B.E., D.S.O., M.C., appointed G.O.C., 53rd Infantry Division, T.A., with the temporary rank of Major-General (January, 1961).

Brigadier J. F. Worsley, O.B.E., M.C., appointed G.O.C., West Midland District, with the temporary rank of Major-General (February, 1961).

Major-General W. F. R. Turner, C.B., D.S.O., appointed G.O.C.-in-C., Scottish Command, with the temporary rank of Lieut.-General (March, 1961).

Major-General R. W. Ewbank, C.B. C.B.E., D.S.O., M.A., appointed Commandant, Royal Military College of Science (early 1961).

Brigadier I. H. Freeland, D.S.O., appointed G.O.C., 54th Infantry Division, T.A., and East Anglian District, with the temporary rank of Major-General (early 1961).

Australia.—Major-General D. A. Kendrew, C.B., C.B.E., D.S.O., appointed Chief Liaison Officer, United Kingdom Liaison Staff, Australia (March, 1961).

Malaya.—Colonel (Temporary Brigadier) W. C. Walker, C.B.E., D.S.O., appointed G.O.C., 17th Gurkha Division, with the temporary rank of Major-General (January, 1961).

Germany.—Major-General A. Jolly, C.B.E., D.S.O., appointed G.O.C., 1st Division (1st July, 1960).

N.A.T.O.—Brigadier G. F. de Gex, O.B.E., B.A., appointed Major-General Artillery, Headquarters, Northern Army Group, with the temporary rank of Major-General (February, 1961).

Promotions

General to be Field-Marshal.—Sir Francis W. Festing, G.C.B., K.B.E., D.S.O., A.D.C. (General) (1st September, 1960).

Lieut.-General to be General.—Sir Richard Goodbody, K.B.E., C.B., D.S.O., (22nd September, 1960).

Major-General to be Lieut.-General.—W. G. H. Pike, C.B., C.B.E., D.S.O. (8th August, 1960).

Temporary Major-Generals, Brigadiers, or Colonels to be Major-Generals.—J. W. C. Williams, D.S.O., O.B.E. (28th June, 1960) ; D. A. K. Redman, O.B.E., B.Sc., A.M.I.Mech.E. (29th June, 1960) ; R. B. Stockdale, O.B.E., B.Sc., M.I.Mech.E. (27th July, 1960) ; J. M. McNeill, C.B.E., A.D.C. (3rd August, 1960) ; A. N. T. Meneces, C.B.E., D.S.O., M.D., F.R.C.P. (6th August, 1960) ; T. H. Birkbeck, C.B.E., D.S.O. (8th August, 1960); J. E. L. Morris, C.B.E., D.S.O. (21st August, 1960); A. M. W. Whistler, C.B.E. (5th September, 1960).

Brigadiers or Colonels to be temporary Major-Generals.—T. H. Birkbeck, C.B.E., D.S.O. (12th July, 1960) ; J. E. L. Morris, C.B.E., D.S.O. (6th August, 1960).

Retirements

The following General Officers have retired:— Venerable Archdeacon V. J. Pike, C.B., C.B.E., D.D., ranking as Major-General (9th July, 1960); Major General L. N. Tyler, C.B., O.B.E., B.Sc., A.M.I.Mech.E. (27th July, 1960); Major-General P. F. Palmer, C.B., O.B.E., M.B., D.P.H. (6th August, 1960) ; Lieut.-General Sir Roger Bower, K.C.B., K.B.E. (17th August, 1960) ; Major-General W. R. Cox, C.B., D.S.O. (21st August, 1960) ; Lieut.-General Sir Eric M. Bastyan, K.B.E., C.B. (30th August, 1960) ; Major-General G. Peddie, C.B., D.S.O., M.B.E. (3rd September, 1960) ; Lieut-General Sir William H. Stratton, K.C.B., C.V.O., C.B.E., D.S.O. (5th September, 1960) ; Major-General P. St. Clair-Ford, C.B., C.B.E., D.S.O. (12th September, 1960); Major-General R. J. Moberly, C.B., O.B.E. (3rd October, 1960); Major-General J. N. Carter, C.B., C.B.E. (3rd October, 1960).

The Royal Engineers End a Long Stint

Responsibility for Works Services in B.A.O.R. has passed from the Royal Engineers to the Command Works Officer. B.A.O.R. is the last Command to come under the Director General of Works, and by the end of the year the transfer will be complete. The Royal Engineers, who have provided the Army's accommodation for hundreds of years in all parts of the world in peace and war, will continue to be responsible for some work of a minor nature, as agents of the Director General of Works, in Malta and elsewhere in peace.

In earlier times the work of the Royal Engineers in this sphere was limited to the erection of living quarters for the garrisons of forts and castles and temporary shelter in the field. The first recorded building of barracks refers to the Royal Barracks at Dublin for two regiments of infantry and three troops of cavalry in 1705.

In 1792 the responsibility for building barracks for cavalry and infantry, but not for artillery and engineers, was transferred to the Deputy Adjutant General, but it was not successful and in 1822, on the recommendation of the Duke of Wellington. all barracks construction and maintenance reverted to the Royal Engineers under the Board of Ordnance. In 1904, as part of the reforms resulting from the report of the Esher Committee, the building of new barracks and hospitals in permanent construction costing £2,000 or more was entrusted to a Civil Barrack Construction Department, but this arrangement also proved unsatisfactory and was ended in 1917.

So it is fair to say that now for the first time the Royal Engineers (from 1787) or their predecessors, the Corps of Engineers (from 1716) or the Engineers of the Board

of Ordnance before that, have completely relinquished responsibility for building and maintaining the accommodation of the Army in peace. Their responsibilities in war will continue.

The link, however, is not entirely severed even now, for the new Directorate has received considerable support from the Royal Engineers in the hand-over period and many of the civilians in the new organization are in fact former Royal Engineers. Some Sappers, too, are attached to the new organization to gain experience for their duties in war.

The Queen's Own Buffs

The Queen's Own Buffs, The Royal Kent Regiment, has been approved by The Queen as the title of the Regiment to be formed early in 1961 by the amalgamation of The Buffs (The Royal East Kent Regiment) and The Queen's Own Royal West Kent Regiment. The short title will be Queen's Own Buffs.

H.M. King Frederik IX of Denmark, who is the Colonel-in-Chief of The Buffs, is to be Colonel-in-Chief of the Regiment. H.R.H. the Duchess of Kent, Colonel-in-Chief of The Queen's Own Royal West Kent Regiment, is to be Colonel of the Regiment, with Major-General V. Boucher, the present Colonel of The Buffs, as Deputy Colonel, and Major-General D. E. B. Talbot, the present Colonel of The Queen's Own Royal West Kent Regiment, as Associate Colonel.

Territorial Army Reorganization

Particulars of a reorganization of the T.A. were announced by the Secretary of State for War in the House of Commons on 20th July.

The future role of the T.A. will be :—

(*a*) To provide headquarters and units to aid the Civil Power and to support the Regular Army in the United Kingdom.

(*b*) To provide units and individual reinforcements for the Regular Army overseas, particularly in B.A.O.R.

(*c*) To provide a framework on which, in a period of rising tension, general preparations for war could be built up.

As organized at present, the T.A. has about 120,000 volunteers and requires some 180,000 National Service men to bring it up to its war strength of 300,000. These National Service men will not be available after 1965/66, and the volunteer element in some units is so low that they cannot be described as viable.

It is therefore intended to reorganize the T.A. on a volunteer strength of 123,000 and streamline it so that units recruit to about two-thirds of their fighting strength in peacetime, and to bring units up to strength on mobilization by introducing a T.A. Reserve for other ranks. Young men would join the T.A. on an initial engagement of four years, after which some would serve on and the remainder, it was hoped, would join the reserve.

This reorganization will result in the amalgamation of the 10 T.A. Divisional headquarters with district headquarters of the Regular Army (retaining the traditional T.A. divisional titles), and the disappearance of the two armoured brigade headquarters and eight infantry brigade headquarters. The number of R.A.C. yeomanry regiments will remain unaltered, but one armoured regiment and four armoured car regiments will be converted to reconnaissance regiments. In the other arms the following numbers of units will disappear:—Royal Artillery, 46; Royal Engineers, 12, but 23 independent squadrons will be retained; Royal Signals, two; Infantry, 18 battalions.

It is also intended to re-equip the reorganized T.A. on training scales of modern equipment, starting this year.

Final details regarding these changes are expected during November.

Army Emergency Reserve

It was reported on 17th August that changes are to be made in the Army Emergency Reserve. The A.E.R. consists of volunteers and National Service men, nearly all specialists, whose role is to produce units and individuals to supplement the Active Army on the outbreak of war.

Category I of the A.E.R. are all volunteers who accept an overseas liability without proclamation. The strength of this Category is declining rapidly. Section A of the Regular Army Reserve is the only other source of reservists who can be recalled without a Royal Proclamation. The main aim of the A.E.R. reorganization, therefore, will be to increase the strength of Category I.

New Radar for British Army

A new radar for locating the position of enemy mortars has been developed for the British Army, and the Ministry of Aviation has placed a production contract on behalf of the War Office. This equipment, the first ever produced in this Country for this purpose, has been developed by E.M.I. Electronics Ltd., in collaboration with the Royal Radar Establishment of the Ministry of Aviation.

It tracks mortar bombs in flight and is thus able to calculate the position from which they are fired, even though this may be entirely concealed from observation. The equipment is small, highly mobile, easy to operate, and extremely accurate.

Miscellaneous

Presentation of Colours.—New Colours were presented to the 1st Battalion, The Worcestershire Regiment, by General Sir Richard Gale at Norton Barracks, Worcester, on 16th July, 1960.

Exercise "Holdfast."—Some 2,000 British parachute troops were dropped into Schleswig-Holstein, behind the 'enemy' lines, during this September exercise, in which more than 40,000 British, Canadian, Danish, and German troops took part.

2nd (King Edward VII's Own) Gurkha Rifles.—Officers and men of this Regiment, after embarking in the carrier H.M.S. *Bulwark* at Singapore, were landed by helicopters and beach landing craft in the Kota Belud (Borneo) training area during a joint exercise in October.

Brevet Promotion.—The names of 19 majors who have been promoted to the rank of brevet lieut.-colonel with effect from 1st July, 1960, were published in the Second Supplement to *The London Gazette* of 5th August, 1960.

AUSTRALIA

Royal Titles for New Regiments.—The Queen has approved the granting of the prefix "Royal" to the title of each of the six Citizen Military Force infantry regiments being formed throughout Australia under the Army reorganization plans. The titles of these regiments will be The Royal Queensland Regiment, The Royal New South Wales Regiment, The Royal Victoria Regiment, The Royal South Australia Regiment, The Royal Western Australia Regiment, and The Royal Tasmania Regiment.

The only C.M.F. infantry unit previously entitled to the prefix "Royal" was The Royal Melbourne Regiment which is now being amalgamated with other Victorian C.M.F. infantry units to form The Royal Victoria Regiment.

Closure of C.M.F. Depots.—A total of 54 Citizen Military Force training depots are to be closed in metropolitan and country areas as part of the reorganization of the Australian Army under a three-year defence programme. Twelve will be closed in Northern Command, 26 in Eastern Command, seven in Southern Command, two in Central Command, two in Western Command, four in Tasmania, and one in the Northern Territory.

NEW ZEALAND

NEW CHIEF OF ARMY GENERAL STAFF.—Major-General L. W. Thornton succeeded Major-General Sir Cyril Weir as Chief of the Army General Staff with effect from 1st September, when the latter took up the appointment of Chief Military Adviser to the New Zealand Government.

MALAYA

COMMONWEALTH ARMY BASE.—Fort George, the new Commonwealth Army base near Malacca, came into being officially on 4th August, when General Sir Richard Hull, C.-in-C., Far East Land Forces, paid a ceremonial visit. It will be the home of the 28th Commonwealth Infantry Brigade Group and will house one infantry battalion from each of Britain, Australia and New Zealand, with supporting units. It is estimated that it will take four more years before all the quarters, churches, schools, clubs, shops, etc., are completed. The cost is being met by Britain, Australia and New Zealand. The foundation stone was laid in 1958.

FRANCE

SENIOR APPOINTMENTS.—General Ely's appointment as Chief of the National Defence General Staff has been extended to 28th February, 1961.

General Louis Le Puloch became Chief of the Staff of the Army on 23rd June.

NEPAL

H.M. THE KING PROMOTED TO FIELD-MARSHAL.—H.M. The Queen has been graciously pleased to approve of the promotion to the rank of Field-Marshal of His Majesty, Mahendra Bir Bikram Shah Deva, Maharajadhiraja of Nepal, Honorary General in the British Army, with effect from 17th October, 1960.

UNITED STATES

SENIOR APPOINTMENTS.—General Lyman Lemnitzer has succeeded General Nathan Twining as chairman of the Joint Chiefs of Staff. General George Decker has succeeded General Lemnitzer as Chief of the Staff of the Army.

General Bruce Clarke has been appointed Commanding General of the U.S. Army in Europe in succession to General Eddleman.

U.S.S.R.

C.-in-C. WARSAW PACT FORCES.—Marshal Andrei Greckho became C.-in-C. of the joint armed forces of the Warsaw Treaty countries in July, succeeding Marshal Ivan Koniev who had held this appointment since May, 1955. Marshal Greckho was C.-in-C. of the Soviet Army in Germany from 1953 to 1957, and since then had been C.-in-C. of Land Forces and First Deputy Minister of Defence.

AIR NOTES

GREAT BRITAIN

H.M. The Queen

The Queen, accompanied by the Duke of Edinburgh, visited the Royal Air Force College, Cranwell, on 25th July. Her Majesty presented the new Queen's Colour and reviewed the 77th entry of flight cadets. During the parade Her Majesty also presented the Sword of Honour and Queen's Medal.

The Queen has been graciously pleased to approve the following appointments:—

His Royal Highness The Duke of Edinburgh as Commandant-in-Chief of the Royal Air Force Technical College, Henlow. (29th June, 1960).

Her Majesty Queen Elizabeth The Queen Mother as Commandant -in-Chief of the Central Flying School, Royal Air Force.(29th June, 1960).

The Queen has been pleased to appoint Air Marshal Sir William L. M. MacDonald, K.C.B., C.B.E., D.F.C., to be Administrator of the Sovereign Base Areas of Akrotiri and Dhekelia in the Island of Cyprus (16th August, 1960).

Group Captain D. B. Hatfield, C.B.E., is appointed Aide-de-Camp to The Queen in succession to Group Captain B. Robinson, C.B.E. (1st July, 1960),

The Reverend B. E. Knight, M.A., is appointed Honorary Chaplain to The Queen in succession to the Reverend J. N. Keeling, M.A. (8th April, 1960).

The Reverend C. Y. McGlashan, M.A., B.D., is appointed Honorary Chaplain to The Queen in succession to the Reverend T. Hankin, C.B.E., B.A. (18th August, 1960),

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Appointments

The Air Ministry announces the following appointments:—

Air Vice-Marshal R. B. Lees, C.B., C.B.E., D.F.C., as Deputy Chief of the Air Staff (18th July, 1960); Air Vice-Marshal P. D. Holder, D.S.O., D.F.C., as Assistant Chief of the Air Staff (Training) (13th July, 1960); Air Commodore W. S. Gardner, C.B., O.B.E., D.F.C., A.F.C., as Provost Marshal and Chief of Air Force Police (13th June, 1960); Air Commodore Edgar Knowles, C.B.E., B.Sc., A.F.R.Ae.S., as Director of Educational Services, with the acting rank of Air Vice-Marshal (3rd October, 1960); Mr. H. Constant, C.B., C.B.E., M.A., M.I.Mech.E., F.R.S., F.R.Ae.S., as Scientific Adviser to the Air Ministry (1st September, 1960); Air Vice-Marshal H. B. Wrigley, C.B.E., as Senior Technical Staff Officer, Fighter Command; Air Commodore C. J. Mount, C.B.E., D.S.O., D.F.C., as Senior Air Staff Officer, No 13 Group, Fighter Command; Air Vice-Marshal B. A. Chacksfield, O.B.E., A.F.R.Ae.S., as Air Officer Commanding No. 22 Group, Technical Training Command (12th September, 1960); Air Commodore A. T. Monks, C.B., M.I.E.E., as Senior Air Staff Officer, Technical Training Command, with the acting rank of Air Vice-Marshal (24th August, 1960); Air Commodore E. D. McK. Nelson, C.B., as Air Officer in charge of Administration, Transport Command (17th October, 1960); Air Vice-Marshal J. Grandy, C.B., D.S.O., as Commander-in-Chief, Royal Air Force, Germany (Second Tactical Air Force) with the acting rank of Air Marshal (7th January, 1961); Air Vice-Marshal J. Worrall, D.F.C., as Senior Air Staff Officer, Headquarters, Middle East Air Force (19th September, 1960).

Retirements

Air Commodore V. D. Morshead (5th July, 1960); Air Commodore W. I. G. Kerby, C.B.E. (11th July, 1960); Air Vice-Marshal Sir Laurence F. Sinclair, G.C., K.C.B., C.B.E., D.S.O. (29th July, 1960); Air Commodore A. D. Messenger, C.B.E. (22nd August, 1960); Air Commodore G. N. E. Tindal-Carill-Worsley, C.B., C.B.E., (29th August, 1960); Air Commodore A. L. Derry, C.B.E., F.A.C.C.A., F.C.C.S. (29th August, 1960); Air Vice-Marshal G. P. Chamberlain, C.B., O.B.E., (25th September, 1960).

Operations

THE MALAYAN EMERGENCY.—The emergency in Malaya, which for 12 years has been fought by forces operating so deep in the jungle that constant air support was necessary, came to an end on 31st July. The Royal Air Force, the Royal Australian Air Force and the Royal New Zealand Air Force were continually engaged. Four R.A.F. squadrons have been operating throughout. Three—No. 45 (Bomber) Squadron, No. 60 (Fighter) Squadron, and No. 81 (Photo/Reconnaissance) Squadron were based at R.A.F. Tengah, Singapore. The fourth, No. 52 (Transport) Squadron operated from Kuala Lumpur in Malaya. Helicopters of Nos. 155, 194, and 110 Squadrons performed a general role of carrying troops and supplies to inaccessible spots and retrieving wounded and sick. Bombers and transport aircraft were heavily engaged. Some 33,000 tons of bombs were dropped during the whole period and over 4,000,000 pounds of supplies annually. The dropping of parachutists was a feature of the operations and its success was greatly enhanced by the use of the 'tree-lowering' gear. The 'Voice Flight' of the Far East Air Force completed its 10,000th broadcast before the end of operations. It has been operated by three R.A.F. squadrons over the last six years—Nos. 267, 209, and 52.

R.A.F. HELICOPTERS' MERCY FLIGHTS.—Two search and rescue helicopter squadrons of R.A.F. Coastal Command, Nos. 22 and 228, with detachments deployed around Britain, have in the last year flown 410 rescue missions, 181 abortive searches, evacuated 62 casualties and carried out 57 live rescues from land and sea—most of them of civilians.

Training

ARMY-AIR EXERCISE.—Exercise "Stormy Petrel" took place towards the end of August. A 1,000-yard airstrip was prepared near Tilshead on Salisbury Plain by the Royal Engineers and this was used as an advanced landing ground for troops, vehicles and guns of the 1st Guards Brigade Group. The airstrip was operated by a R.A.F. staff of 70 signals, medical, technical and air movements personnel. Beverleys of Nos. 47 and 53 Squadrons, operating from R.A.F. Colerne, airlifted the 1st Bn. Royal Welch Fusiliers, completing the move of some 650 men with 100 tons of freight and about 90 vehicles; trailers and guns within 24 hours. Hastings aircraft of Nos. 24, 36 and 114 Squadrons, parachuted supplies. Helicopters and Pioneer short-range transport aircraft of Nos. 225 and 230 Squadrons were engaged in the tactical movement of troops, casualty evacuation, and the air movement of ammunition and other supplies.

N.A.T.O. EXERCISES.—In the exercises which ended at the beginning of October maritime aircraft (Shackletons) of Coastal Command flew 135 sorties in over 1,500 hours to sight 77 'enemy' submarines and attack 20. They also sighted and reported some 25 warships. They operated mainly from the R.A.F. stations at St. Mawgan (Cornwall), Ballykelly (Northern Ireland), Kinloss (Morayshire), and Gibraltar. Some Shackletons refuelled at airfields in Northern Norway. Others were temporarily based at Valkenburg, Holland. Also taking part were Royal Canadian Air Force Argus Aircraft, U.S. Navy and French Air Force Neptunes, and Gannets of the German Air Force. All these aircraft made 295 sorties, involving over 3,000 flying hours including over 1,000 hours by night. They sighted a total of 130 submarines and many surface vessels during the exercise. Weather flights by Coastal Command Hastings aircraft totalled 225 hours and U.S. aircraft flew 150 hours.

Flights

VALIANT FLIGHT.—A Valiant of R.A.F. Bomber Command, on 8th July, set up a record non-stop flight from Vancouver to Marham, Norfolk, in 9 hours 35 minutes, at an average speed of 523 miles per hour.

FAREWELL TO 'TREBLE ONE.'—The "Black Arrows" of No. 111 Squadron gave their last performance before British crowds on 17th September. The squadron is shortly to convert to Lightnings. Some 150 displays (120 at home and 30 abroad) have been given; the team has performed in Belgium, France, Germany, Holland, Italy, Norway,

Portugal and Switzerland. In 1959 the Squadron was honoured by the award of the Britannia Challenge Trophy by the Royal Aero Club "for the most meritorious performance in the air during the year."

NIGERIA.—Three Valiants of No. 7 Squadron and four Jet Provost training aircraft from the R.A.F. Central Flying School, a Britannia and a Comet, represented the Royal Air Force at the celebrations marking Nigerian independence.

MATERIEL

VICTOR MARK II AIRCRAFT.—The Air Ministry stated on 2nd August that "it has been decided to cancel some Victor Mk. II aircraft at present on order for the R.A.F." The statement added: "This follows an examination of the numbers required in order to maintain the effectiveness of the strategic deterrent following the equipment of the V-bomber force with stand-off weapons."

TSR–2 CONTRACT.—It was announced on 20th September by the Ministry of Aviation that a contract to develop the TSR–2 supersonic tactical strike and reconnaissance plane for the R.A.F. is to be placed shortly with the British Aircraft Corporation. It is expected to be available for service by 1965 and to continue for about seven years. It is expected to have a short take-off; ability to take off and land from any firm surface such as grass or compacted earth; a "contour-follower" which will keep the aircraft automatically at a pre-determined height above the ground. It would be used in low-level flights to avoid detection by radar.

FOAM CARPETS.—Two more R.A.F. airfields in the Mediterranean area—Luqa (Malta) and El Adem (Libya) will shortly be equipped with foam carpets. These greatly minimise the fire risk to aircraft crash-landing because of undercarriage failure. The device will be available not only to the R.A.F. but to the many civil aircraft passing through the area. The first foam carpet was laid at Akrotiri (Cyprus), and it proved its worth a year ago when a "wheels up" emergency landing by a Canberra caused the aircraft so little damage that it was flying again in three weeks. Since then the time of preparation has been much reduced, and the Akrotiri strip can now be made ready in 6½ minutes.

"BLUE STEEL".—On 22nd September, the Minister of Aviation said that Britain would soon test the Blue Steel stand-off bomb at Woomera rocket range. It is understood that this will be before the end of the year.

"SKYBOLT."—A working agreement between the United States and Britain for mutual development of the air-launched Skybolt missile has been completed in Washington, and the formalities of signature are about to be completed. Speaking on 22nd September, the Minister of Defence said that Skybolt was a splendid example of Anglo-American co-operation. But that did not mean it was the touchstone of Britain's defence policy, nor did it diminish the British Government's interest in N.A.T.O.

MISCELLANEOUS

BOMBER COMMAND EFFICIENCY TROPHY.—The new Bomber Command efficiency trophy, in the first year of competition, was won by No. 90 (Valiant) Squadron. The trophy, which is in the form of a 2-ft.-high figure of an angel holding aloft a symbolic torch of life, was presented to Bomber Command by No. 460 Squadron, Royal Australian Air Force, in memory of 1,000 squadron aircrew killed in action in World War II. It is awarded annually to the V-bomber squadron achieving the best all-round performance in all facets of operation and training—in the air, on the ground, at home and overseas.

SASSOON TROPHY.—Canberra PR. 7s of No. 80 Squadron have this year been awarded the Sir Philip Sassoon Trophy, given annually for aerial photography by squadrons in R.A.F. Germany. Five R.A.F. squadrons, and one from the Royal Netherlands Air Force, each backed up by a mobile field photographic section, took part in the competition, teams consisting of five crews and one reserve crew. Targets which had to be reconnoitred were set in the hilly country of the Belgian Ardennes.

TRENCHARD MEMORIAL AWARDS.—The Air Council has instituted a number of annual cash grants, known as Trenchard Memorial awards, for individuals or small groups of R.A.F. personnel engaging in projects of a sporting or adventurous nature. The scheme is open to all members of the Service including the W.R.A.F. and the P.M.R.A.F.N.S. A committee, under the Air Member for Personnel, will meet each January and July to consider applications for awards—which are to defray expenses of unconventional projects. The total annual grant is £2,500, provided from the R.A.F. Central Fund.

LORD TROPHY.—The Lord Trophy for 1960 has been won by No. 84 squadron which operates Beverleys at Khormaksar in the Arabian Protectorate. The competition, which includes low-level flying, precision navigation and paratroop dropping, was held at Colerne earlier this year. Runners-up were No. 30 Squadron from Eastleigh, Kenya.

GORDON SHEPHARD MEMORIAL PRIZE ESSAY, 1960.—The prize winners were:—First, Group Captain N. Cameron, D.S.O., D.F.C.; Second, Air Commodore W. Carter, D.F.C.; Third, Group Captain M. M. Gardham.

CANADA

INTEGRATED HEADQUARTERS, ESQUIMALT.—A Deputy Commander was established, from 1st July, at the integrated headquarters, RCN/RCAF, of Maritime Command Pacific, at Esquimalt, B.C. The post was filled by the Air Officer Commanding No. 5 Air Division with headquarters at Vancouver, who will thus have a dual role.

APPOINTMENT.—Air Vice-Marshal J. G. Kerr, C.B.E., A.F.C., has been posted to the Headquarters of 4th A.T.A.F. in Germany. He is being succeeded as Air Member for Personnel at Canadian Air Force Headquarters by Air Vice-Marshal W. A. Orr, C.B.E., who relinquishes his appointment as Commandant of the R.C.A.F. Staff College in Toronto.

MATERIEL.—The First military version of the Convair turbo-prop has been accepted by the R.C.A.F. and has made its initial cargo flight from Ottawa to Goose Bay, Labrador. The R.C.A.F. has ordered 10 of the Convair 540s, which it calls the "CC–109 Cosmopolitan."

AUSTRALIA

C.A.S. DESIGNATE.—Air Vice-Marshal V. E. Handcock, C.B., C.B.E., D.F.C., R.A.A.F., is to succeed Air Marshal Sir Frederick Scherger, K.B.E., C.B., D.S.O., A.F.C., R.A.A.F., as Chief of the Australian Air Staff with effect from 29th May, 1961.

AIR MEMBER FOR PERSONNEL.—Air Vice-Marshal W. L. Hely has been appointed Air Member for Personnel, to succeed Air Commodore F. Headlam. Since the end of the last war he has been Director of Organization, Air Officer Commanding Training Command, and Deputy Chief of the Air Staff.

GLOUCESTER CUP.—No. 1 (Bomber) Squadron has become the first squadron of the R.A.A.F. to annex this award three times since it was first presented in 1946. The cup was presented by the Duke of Gloucester at the close of his term as Governor-General of Australia, for competition among R.A.A.F. squadrons. It is awarded annually for overall efficiency including discipline, flying, and morale.

WOOMERA.—The Australian Minister of Supply, Mr. Alan Hulme, said in a Press statement on 12th July that the importance of Woomera as a testing ground would not be affected by Britain's cancellation of the Bluestreak missile project.

REVIEWS OF BOOKS

GENERAL

The Price of Victory. By R. W. Thompson. (Constable.) 25s.

No student of modern military history, which is the history of the second World War and its aftermath, can neglect the four most recent books written by R. W. Thompson, for he has the rare knack of making military action come alive to the reader. *Cry Korea* and *The Battle for the Rhineland* are models of operational literature; they take the reader under the skin of war. In Part IV of *The Price of Victory*, 'The Day of Decision,' the author brings D-day, 6th June, 1944, into focus and vivid animation; Part IV even in isolation justifies the book. But the keynote is to be found in the epilogue; "This day, the 6th June, was Britain's Swan Song . . . On D-day Britain ceased to be a major power in the world, no longer even to shape her own ends. The new Europe would not be hers, or of her making." It is Thompson's argument that "the pattern of war flows towards the climax of that day from the last hours of Dunkirk. Thereafter, all flows away from it. So I saw D-day as a focal point of the mid-20th century . . . . There were some well-known and startling facts about 'Operation Overlord' which made one wonder. Above all, the lack of an object. Lieut.-General Sir Frederick Morgan . . . has written that there was never an object for 'Overlord' . . . some of us have been searching for an object ever since. I joined in the search on my own account. A free lance."

The Price of Victory is, in fact, an interim report on the progress of this search. "I have at the best blazed some sort of trail, challenging and trying to grasp some of the shadows. It may be of some help to men and women without the time to read and digest masses of documents and books." The author is too humble, for his interim report is of the greatest help and the first importance. It means, however, that he must abandon the familiar ground of the battlefields for the vague morasses of the council chambers, where decisions were sometimes reached and as often elided. The hunt for the object follows the dreary trail of top-level conferences from Arcadia to Casablanca and Quebec. At each of these, Britain's influence on strategy and end policy deteriorated; by D-day, so goes his argument, Britain had become the poor relation of the U.S.A. 'Unconditional surrender' applied not alone to the Axis but to the British Empire: "In a moment—on the spur of the moment—the war was prolonged, Soviet dreams brought within reach, and the course of history drastically changed."

The writer has much to say on military semantics; Americans and Britons do not speak the same military language when using the same words, for Americans are not Britons. Neither did the Americans of the second World War endorse British strategy, or only with reluctant suspicion. Admiral King, U.S.N., with his jealous fingers on the vital landing craft, becomes the 'nigger in the wood pile.' Thompson has much of interest to say about Cossac; with a side-glance at the still-unpublished 'Skyscraper' planning. His description of the pre-day build-up in Britain is fascinating and also fine writing.

Where the hunt for the truth behind the object may have gone astray is, perhaps, in a failure to assess the importance of Britain's last chances in the campaigns in the Desert and South-East Asia; had we not so often thrown victory away during 1940–41, our bargaining position in 1942 must have been stronger. And 1942 was the vital year. The evidence so far marshalled shows that the U.S.A. was in no hurry—but for Britain the prolongation of the war into 1945 was disastrous. *The Price of Victory* is thus a "prolegomena to the decline and fall of the British Empire," an interim report for a future Gibbon. One hopes that as further evidence comes to hand, the author will give us more. But this is enough to go on with, on any account.

The Desert Generals. By Correlli Barnett. (Kimber.) 30s.

Mr. Correlli Barnett considers the case histories of Generals O'Connor, Cunningham, Ritchie, Auchinleck and Montgomery, with a notice or two on Generals Wavell, Beresford Peirse, Gott, Norrie, and Rommel. Of the full-length studies, O'Connor and Auchinleck alone emerge with top marks, the two British counterparts of Rommel, the exponent of the battle of manœuvre. The Alamein controversies still rage and still the grinding of axes is heard in the land.

There is a head-on attack on Montgomery's handling of the Alamein battle and of the pursuit, the latter being castigated as being on too broad a front. By this the author intends, one supposes, that it should have been an enveloping pursuit in the manner of O'Connor in 1941, aimed at the defiles about Sollum, an operation suited to really mobile infantry and armoured cars.

After browsing on this book, the reader will agree with Marshal Saxe, who wrote in his *Reveries*, " Unless a man is born with talent for war, and that his talents moreover are brought to perfection, it is impossible for him ever to be more than an indifferent general." This book quite bluntly faces us with that proposition. We all know that competent administrators grow by the dozen, but that the man who is a sufficient craftsman and artist to fight successful battles of manœuvre against a capable, well-equipped opponent is as rare as a swallow in winter. We have not yet found a way of bringing such men to the top in peacetime. One thing is certain, and it is that no man is fit for high command in peace or war who is not an outstanding trainer of officers and men. If Mr. Barnett's book has done no more than thump that home, it will have served its purpose.

It is nowadays the fashion to go gunning after Mr. (as he then was) Winston Churchill for girding at his generals. Commanders in the field are not helpless; they can resign if they don't like the treatment. Rather than try to pin responsibility for the Tobruk disaster on the then Prime Minister, the author should have further analysed the layout of the Tobruk-Gazala battle area for the defensive-offensive in which, with the forces at our disposal and in sight, it was plain that with an intelligent defensive system founded on Tobruk and the escarpment passes, the force of manœuvre swinging free on the desert to the south, we could have given Rommel the sharpest lesson of his career.

Our hearts are still too small for us to abandon the regimental spirit as the author would have us, for it has stood us well when things have gone hardly. It is true that in the latter war years infantry units became mixed, often by deliberate intent of the home authorities, but that did not make it a good policy; indeed it proved in practice to be harmful and much resented by the men themselves. We can assure him that the divisional spirit also burned ever more brightly as friendship grew among the units.

It seems that Mr. Barnett's advisers would have us believe that there is some mystery about the handling of armour in battle. There is none and never has been any, though from some of its Desert operations the author may well have been brought to think so. The Army has suffered altogether too much from the closed shop of the *corps d'élite* which is so hedged with limitations as to its use that no one else is ever practised in handling it. Any skilled infantry division in the Western Desert could, by a bold, fast night assault on a located Panzer leaguer, have in one night reduced Rommel's Army by one division of tanks, and compelled a drastic change thereafter in that doughty General's tactics. It is a pity it was not done and the tanks brought into proper perspective.

Military readers of this book—and there will be many—can assess for themselves, with the official history at their elbow, whether the author's commendations, strictures, and assessments are deserved. His portrait of Beresford Peirse, for instance, is, we believe, ill drawn.

For one who has not himself gone into battle, the writing of this book was at least a brave undertaking. It is well written and the plates are excellent, the sketch maps adequate.

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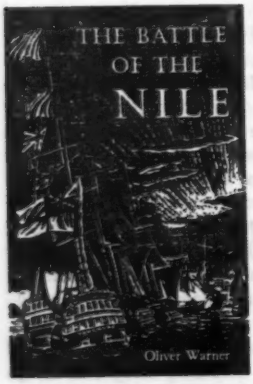

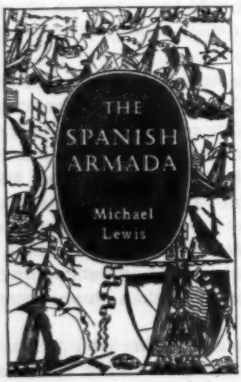

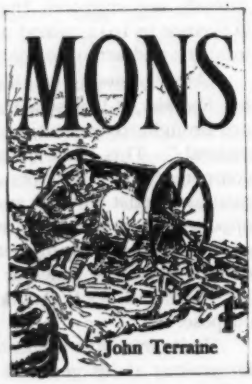

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The Foxes of the Desert. By Paul Carell, translated from the German by Mervyn Savill. (Macdonald.) 30s.

This is mainly a story of the German Afrika Korps from 1941 to the end in Tunisia in May, 1943, but it also includes much of interest on the naval, air, and intelligence side of the African operations. Its attraction is that it tells the tale, not only from the point of view of the German generals but, by personal anecdote, from that of the private soldiers also. It patently tries to be fair between German and British and, notably, between German and Italian, and this is well because the Italian soldier has had a raw deal from some other authorities, whereas those who fought him at Keren, Alamein, Takrouna, and in some other battles, know that there is another side—that side which the author now presents.

We have of late had written for us many stories of these African operations, but even at this late date it will do no harm to see ourselves as others saw us. It is not a gibe when Mr. Carell (a pseudonym for a German author) accuses British generals of that time of a 1914–18 mentality, and points to Rommel's superior handling of the mobile battle. Let us hope this mentality has now disappeared, and that that of 1944–45 has not replaced it along with conventional weapons and forces. Although this book is not history, and although there are obvious mistakes, such as assigning the enterprising author, Desmond Young, to the command of 10 Indian Infantry Brigade at Gazala, it makes some enlightening assertions. For instance, Carell maintains, contrary to some others, that the de Guingand doctored map planted before the battle of Alam Halfa, had a considerable effect in misleading the German Command; that the handling of the German 88s as flak guns at Gazala as an integral part of the armoured battle was a method that could well have originated from the British side with the 3.7-inch A.A. gun, and illustrates the flexible German military machine and the rigid British one. It must be some satisfaction to survivors of 18 Indian Infantry Brigade to know that its defence of the Deir el Shein was decisive in the time and armour it cost Rommel. However, neither Carell nor anyone else has explained to us how the Afrika Korps escaped complete destruction at the battle of Wadi Akarit.

We cannot tell how far the story is accurate. Enquiry from former staff of 4 Indian Division shows that the tale of the staff sergeant and the two marked maps on p. 73 is a most improbable one, because on that day the Division was at and east of the frontier, far from the fighting, and not even the G.O.C. had a copy of the Rommel map. And the remark on p. 361, " The 4th Indian Division was beaten off once more," is also incorrect, for it had in fact broken through and was careering east to deliver the *coup de grâce*.

There is plenty of ' cloak and dagger,' L.R.D.G. and Brandenburg Group, and even a bit of spying. Perhaps the author hunts too often for treachery as the cause of German defeat; after all, they made some alarming mistakes themselves in battle. One finds it hard to believe that the belly-dancing beauty, Hekmat Fahmi, could have really been an efficient German agent, because she looked as though she was precisely that and British Intelligence isn't any dimmer than the rest of us. In Cairo in those days the very mixed population probably earned quite a bit working for both sides. There are no flies on some people.

Rommel and his Afrika Korps were bold in attack and staunch in defence. Boldness pays, so does defence to the last man and the last round, and to the last drop of water in the desert. The other man is often in more desperate plight than one is oneself.

The translation is fluent and the plates are excellent. The sketch maps are adequate, but one general map would be welcome.

Official History of the Canadian Army in the Second World War. Volume III. The Victory Campaign—The Operations in North-West Europe, 1944–1945. By Colonel C. P. Stacey, O.B.E. (The Queen's Printer and Controller of Stationery, Ottawa.) $4.00.

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military historians of outstanding ability in Colonel C. P. Stacey and Lieut.-Colonel G. W. L. Nicholson. The former is responsible for this volume, which follows the fortunes of the Canadian forces from the Normandy beaches and bridgehead, through the pursuit along the coastal sector into Holland, and the final advance to the Weser in May, 1945. The whole production is excellent. The story is clearly told and the supporting maps carefully drawn to assist the reader.

There are certain aspects of this campaign on which the views of the Canadians are of special interest since they were primarily involved, but only two can be mentioned here. The first concerns operation 'Totalize,' launched east of the Odon in the second week in August, when the plans prepared by the 2nd Canadian Corps "contained two features of marked originality." In the opening phase there was no preliminary artillery bombardment, and the two attacking divisions, each with an armoured brigade under command, advanced, covered, for the first time by night, by more than a thousand aircraft of Bomber Command, while the leading infantry accompanied the tanks in the assault, riding in 'priests' hastily converted into armoured personnel carriers. The second relates to the operations following the seizure of the port of Antwerp by the 2nd British Army, on 4th September, with all its harbour facilities virtually intact. This thrust cut off the 15th German Army, whose fate might have been sealed if the allies had driven hard for Breda. Unfortunately, "it was also the worst moment of the allied supply famine," while at the same time Field-Marshal Montgomery was so involved in resisting General Eisenhower's 'broad front' strategy that he tended to overlook the importance of opening Antwerp, which might have made his own concept a possibility. For "the point is worth making, that Montgomery's administrative calculations turned out to be unsound." It was not till after the middle of October that the clearance of the

Scheldt was given the priority it deserved, and by that time the Germans had rallied and the resulting fighting was some of the most severe that the Canadians were engaged in, for it was not till 28th November that Antwerp was opened to ocean shipping.

This is the first official account of these operations to be published, and it would seem to indicate that, in September, the administrative appreciations prepared by S.H.A.E.F. and by 21 Army Group were so divergent as to cause the allies to falter in their conduct of the campaign.

The Rebels : A Study in Post-War Insurrections. By Brian Crozier. (Chatto & Windus.) 21s.

Here is a careful study of the men who have led insurrections in many parts of the world; in Algeria, the Philippines, Indo-China, Indonesia, Cyprus, Malaya, Burma, with a mention of Tibet and Hungary; showing what each rebellion had in common and the common mistakes of the administrations concerned. For the British, the lesson so learned may before many years be little more than academic; for Communist countries it is possible that they may remain of concern for some time yet. The author has not put it to us in so many words, but one concludes for oneself that a Parliamentary democracy, with an Opposition that regards it as its business to oppose, cannot for long administer dependent territories, where its local governments necessarily rely for their authority on a large measure of support, not to say loyalty, from their citizens. It is always easier to prod the discontented into violence than to stir loyal men into using force to assert themselves.

The author obviously agrees with the well-worn saw that the solutions of these outbreaks must be political rather than military. No one will cavil at that as a general rule, but your reviewer can remember more than one insurrection in his lifetime that was settled by purely military measures, with whatever political solution that might ensue being left to the dim future. It is of little advantage to contrast the inconclusive effects of Lord Harding's measures in Cyprus with the success of those of Sir Gerald Templer in Malaya, where a political end was sought from early on. After Lieut-General Sir Harold Briggs (to whom the author is about the first to give proper credit) had laid the military foundation for dealing with the terrorists, pressure on them was unremitting until the end, whereas Lord Harding's measures in Cyprus were for ever bedevilled by pauses enforced by politicians, while every political offer, whether it was desired by the majority of Cypriots of all nationalities or not, was thrown out by the rebels. General Darling's name does not appear as an authority; this resourceful commander may yet have valuable evidence to offer concerning the last phase.

Terrorism, Mr. Crozier rightly concludes, never pays dividends; terrorists come to be hated by the inhabitants for their reprisals on loyalists and on innocent people, and are held in contempt as cowards by all others.

The forestalling of an outbreak—" A Glimpse of Sanity " is the rather patronizing term employed—is not the simple matter of political concessions to identifiable leaders that the author seems to think it to be. The situation is always fogged by a jumble of democratic objectives; humanism, threatened violence and the maintenance of law and order, Christianity pouring new wine into old bottles, Communist infiltration, financial and economic interests, the exceeding difficulty of spotting the honest, disinterested leader, and above all the caution imposed in avoiding an irrevocable mistake. Not all progressives, not all rebels, are the friends of liberty.

This is an interesting and very readable book, tinted by the author's liberal-mindedness, and it contains a great deal of information in a small space. It could have been more easily assimilated by the reader if each rebel and his own insurrection were treated separately and the conclusions thereafter drawn from them. This would have saved a certain amount of repetition, but the author obviously considered that the book would thereby have lost in other ways. One important conclusion to have been drawn

might well have been that a local administration whose civil, police, and military officers speak the native tongues is essential to sympathetic relations with the people and to a good intelligence service, without which no far-sighted action can ever be taken.

Foch *versus* Clemenceau. France and German Dismemberment, 1918-1919. By Jere Clemens King. (Harvard University Press; London, Oxford University Press.) 32s.

This small volume which forms one of the Harvard University Historical Monographs is a study of the struggle between two of the greatest Frenchmen of the present century. It was not a struggle for power, but a contest of wills between two men, both impelled with the highest motives of patriotism, but cast in very different moulds.

Marshal Ferdinand Foch had led the allied Armies to victory over Germany in 1918. A tough fighting soldier of the old school, suspicious of politicians as a class, held in high esteem by the allies and the heroic victor in the eyes of the French public, he steadfastly opposed the total occupation and disarmament of Germany. To overrun Germany, he argued, would lead to further and unnecessary loss of French and allied lives, whilst disarmament would lead to a false sense of security since nothing would prevent Germany, should she so will, from rearming in secret. His counsel prevailed and the armistice was signed with the allied Armies far distant from Berlin. He then turned his attention to the peace treaty and forcefully advocated a massive truncation of the Rhineland, which in the opinion of the allies would have been certain to produce a perpetual irredentist agitation leading possibly to war.

George Clemenceau, ' The Tiger,' Premier of France, the patient and subtle negotiator, whilst in sympathy with Foch's ideas, realized that peace terms imposed by France without the support of her principal allies, Britain and U.S.A., would be no guarantee against German aggression in the years to come. Nevertheless, behind the scenes and out of the council chamber, he argued tirelessly with members of the British and American delegations to persuade them that France's frontier must be drawn along the Rhine—but without avail. To President Wilson and Lloyd George, Foch's idea of a separation of the Rhineland provinces, imposed by the allies, would be a negation of the principle of self-determination for small nations for which they had fought. Foch remained obdurate and the consequential relations between soldier and statesman are crystallized in the following exchanges between them: " Well, Mr. President, I see now that you have to lead the allies, you discover as I did that it is not always easy." To which Clemenceau replied: " Pardon, Marshal. You have forgotten one thing: you were their chief and were recognized as such. You, therefore, could order them. With me it is an altogether different matter. I have no authority to give them orders."

Thereafter Foch, relying on his own reputation and prestige and stung by Clemenceau's justifiable refusal to include him amongst the French plenipotentiaries to the Peace Conference, left no stone unturned to foist his own ideas on the peacemakers.

Against the background of the diplomatic exchanges between France, her allies, and the Germans, the author gives a vivid account of the Marshal's manœuvres to attain his own ends. Having failed in his attempts to influence the allied delegates to Versailles, he resorted to extreme measures—open defiance of Clemenceau's instruction for the conveyance and arrival of the German delegation, threats of resignation, articles in the Press, and finally intrigues with leading Germans who attempted to establish a separate Palatinate-Rhineland State. As a final gesture of defiance, we see him absenting himself from the ceremony in the Great Hall of Mirrors at Versailles when the Peace Treaty was signed by the German plenipotentiaries.

Not the least surprising facets in this struggle between soldier and statesman are the tacit support given to Foch by President Poincaré and the negative attitude of the French Parliament. In the light of subsequent events, one can but agree that it was fortunate that Clemenceau's policy prevailed.

John Jacob of Jacobabad. By H. T. Lambrick. (Cassell.) 63s.

Mr. Lambrick was for many years an officer of the Indian Civil Service in its palmy days and was at one time Deputy Commissioner of the Upper Sind Frontier where, as the publisher tells us, "he sat in Jacob's seat," qualifications which ensure a scholarly book and one enriched by experience. It is indeed a great biography, as well as a vital contribution to British-Indian frontier history. Inquire today in 10,000 households in England, and you will be lucky if you find one single member of any one of them who has ever heard the name of John Jacob. Read this book and wonder why.

Here is a full-length portrait of this born soldier, this able and devoted administrator, philosopher, inventor, and author, whose whole career, with but a brief interlude in Persia, was spent in Sind, and whose life was in the end surrendered to its attractive and unruly tribes. That arduous career brought these deserts to bloom, but in 1858 then killed Jacob at the early age of 46.

The story begins in 1812 at Woolavington in Somerset, where his father, of old Kentish stock, was the rector. After training at Addiscombe, young John in 1828 sailed for Bombay to join the artillery of the Bombay Army. His energetic soul soon found itself away up on the Sind frontier where he was set to work to raise a regiment of Irregular Horse—the 'Ironsides' of his day; thenceforward enjoying himself in forays against Baluch, Sindi, and Kelat tribesmen. On that wild border in those days, peace and the law were kept by British officers of the Indian Political Service, half soldier and half civilian, the counterparts of Herbert Edwardes in the Punjab and William Sleeman in Central India. Jacob became one of them. With him were other famous men; Charles Napier, James Outram, Bartle Frere, and a galaxy of younger men under him, such as Merewether, the Greens, and Malcolm, fine fighters and good men. Outram and Frere became Jacob's lifelong friends and admirers.

The brilliant Jacob had his quarrels, many of them, oddly to our modern ears, fought out in the Press over thinly disguised *noms de guerre*. Outram and he lashed at the Napiers, and the Napiers readily paid back in the same coin. Jacob applied his abundant mental energy in this wise while wonderfully improving his Irregular Horsemen, and anticipating Sandeman with a remarkable Frontier system, one good enough to arouse the envy of the Punjab.

To a soldier the two most remarkable successes were his regiments of Irregular Horse and his inventions in artillery and in rifles. The Horse were armed with sabres, carbines, and pistols, all of Jacob's own design. His cavalry would beat any guerrillas at their own game and would then ride in with sabre and carbine in close combat and overthrow a vastly superior cavalry, as in the Sikh wars at Gujerat. Had the Army that went to the Crimea adopted Jacob's very accurate long-ranging cannon and small arms, the story of that war would have been entirely different. His Lieutenant Green took one rifle to the Crimea and demonstrated it there, but it was ignored.

One puts down this volume with a sense of gratitude for the historian-biographer, and of intense admiration for his hero. One cannot, however, allow this opportunity to pass without quoting just once, from a letter of Jacob's to Bartle Frere. "Let Government cease to allow the Military Secretary to treat me like a returned convict . . . ."

NAVAL

The Spanish Armada. By Michael Lewis. (Batsford.) 21s.

Quiberon Bay. By Geoffrey Marcus. (Hollis & Carter.) 25s.

These two outstanding events in the annals of the Royal Navy are separated by more than a century and a half. If the books under review are read in succession, the reader is able to obtain an excellent idea of the changes between the sixteenth and eighteenth centuries—changes in naval oganization and battle tactics even more, perhaps, than in the design of ships and weapons. Slow as they may seem in comparison with the tempo of our own revolutionary age, these changes were nevertheless highly significant.

In regard to the Armada, the recent work of Garrett Mattingly (reviewed in the February number of this JOURNAL) brilliantly depicts the political, economic, and ideological background to the campaign. In his new book Professor Lewis concentrates mainly on the actual fighting, the handling of the opposing fleets, their respective battle tactics and armaments. At the outset the author, referring to the commercial and slave-trading activities of a Drake or a Hawkins, warns that " it is fruitless to judge any man by the standard of a day not his own "; yet he cannot resist introducing a few epigrammatic analogies with our own times. Thus " the Marquis of Santa Cruz was to Philip's Spain what von Tirpitz was to Wilhelm II's Germany "; or " relations between England and Spain from 1569 to 1585 were what to-day would be described as the cold war."

Lewis criticizes two eminent naval historians—Sir John Laughton, for basing the Armada strength in ships, sailors, and soldiers on Santa Cruz's 1586 plan instead of on the much smaller actuality of 1588; and Sir Julian Corbett, " the greatest modern authority on the Armada fighting," for thinking that the action between the fleets off Plymouth on the first day took place at point-blank range. He maintains that the only point-blank action was at Gravelines. In the fighting on 24th July, Lord Howard of Effingham for the first time organized the fleet into squadrons, and this marked the beginning of English sailing-fleet tactics.

Any historian of the Armada fighting must necessarily depend on his own interpolation of the available evidence, for the chief English authority, Howard's *Relation of Proceedings*, is never helpful in elucidating tactics, while Sidonia's reports to Philip II were obviously coloured by his desire to cover up deficiencies. Lewis completely demolishes the misconception that has clung to the ill-fated Armada—that the Winds of Heaven and not the Arms of Man were responsible for its disasters. At the same time he disagrees with Mattingly's surprisingly low estimate of only ten Spanish ships wrecked on the Irish coast, and supports the assessment of W. S. Green, the Irish Fisheries' authority, of at least 25 ships lost from this cause.

If the Elizabethan Navy of 1588 was the product of rapid improvisation and adventurous spirits of the calibre of Drake and Hawkins, the Navy of the Seven Years' War was the carefully planned creation of Anson. Geoffrey Marcus portrays the effectiveness of Pitt's strategy, which was so admirably served by Anson at the Admiralty, with Hawke never relaxing his watch on the French fleet at Brest. What distinguishes this author's account of the blockade of Brest and the Morbihan and of the Battle of Quiberon Bay in November, 1759, is the precision of his facts, the orderly presentation of the events, and the sympathetic understanding of the hardships and frustrations of the naval campaign. His somewhat detailed enumeration of the movements of ships engaged in the inshore blockade and of their supply difficulties serves to emphasize the tediousness of these stormy patrols, without which the timid Conflans could never have been brought to action.

When the French Admiral at last took advantage of the favourable wind and the temporary absence of Hawke to effect a junction with the invasion fleet assembled in the Morbihan, he was spotted in the nick of time and brought to action during a westerly gale, with Hawke's ships chasing the French past dangerous rocks and shoals into ignominious retreat up the Vilaine river or shipwreck on the rock-bound lee shore. Two British ships were wrecked in the process—a small price for victory. For the British fleet, with its much-tried, weather-beaten seamen, this was a superb display of courage and seamanship, and a fitting reward for months of hardship and tribulation. For Hawke it was the crowning but by no means the last achievement of an outstanding career. In England, where the capture of Quebec had only recently been celebrated, it was realized that this new victory marked the end of French dominance on the American continent. It also generated the " Heart of Oak " tradition that was to inspire future generations of naval leaders through many years of adversity, until Trafalgar set the seal on British

sea power for more than a century to come. All this is admirably set down by Mr. Marcus, whose work is an example of scholarship ably applied to a shining chapter of our naval heritage.

ARMY

A Full Life. By Lieut.-General Sir Brian Horrocks, K.C.B., K.B.E., D.S.O., M.C. (Collins.) 25s.

Then a Soldier. By Brigadier-General A. B. Beauman, C.B.E., D.S.O. (P. R. Macmillan.) 13s. 6d.

Army Diary. By Colonel R. Meinertzhagen, C.B.E., D.S.O. (Oliver and Boyd.) 30s.

Taken together, these three examples of autobiographical writing present a fascinating panorama of military life, its fortunes and hazards, in peace and in war, made still more attractive by the widely varying personalities and outlooks of the three authors. As one would expect, General Horrocks is supremely entertaining. The writing, except where he treats us to a few nuggets of military wisdom, is as light as a feather and we would not have it otherwise. His career, by no means finished, has been colourful and everything seems for the best in the best of all possible worlds. We can only hope he will have more to write later. The pen, for a few of us, is still mightier than the ' telly.'

At the time when Lieutenant Horrocks was a prisoner of war, insufferable to his captors, General Beauman, who also started the first War as a subaltern, commanded a battalion in the line for 19 months, achieved command of a brigade at the age of 29, and continued to command it in France and Italy until the end of the war, having acquired two D.S.O.s and two brevets. He then had to face the hazards of 20 years of peace and it was not until 1934 that he again got a brigade—a long time it must have seemed, though it contained some interesting jobs and any amount of rod, gun, and horse. Called out of retirement at the start of the second World War, his active service in two important L of C posts culminated in command of the Beauman Division, a formation put together after the German onslaught and which, after Dunkirk, fought a long delaying action back to Cherbourg. These post-Dunkirk operations are not well known and Beauman's last four chapters may come as much as a surprise to some today as news of the actions did to the Assistant Military Secretary when Beauman reported to the War Office at the end of his job. (" Oh, did you have any fighting ? ") He was retired in 1944 as an Honorary Brigadier-General, no more, a rank he had first attained 27 years earlier. The writing is modest and dispassionate for the most part though the author allows himself an occasional piece of pointed criticism, the best being concerned with the inter-war years. Lord Alanbrooke, in the foreword, pays a fine tribute both to Beauman and his Division.

As to Meinertzhagen, whom T. E. Lawrence in *The Seven Pillars of Wisdom* described as " a student of migrating birds drifted into soldiering . . ., " one can only wish his diaries could go on and on. He has already given us *Kenya Diary*, 1902–1906, and *Middle East Diary*, 1917–1957, and now comes *Army Diary*, 1899–1926, which threads its way through his tempestuous life, omitting the material of the other two books. Orthodox soldiering seems to have meant little to him. In his final summing up he fulminates against life in the groove, life which he avoided with no little success. There is no space here to begin to catalogue his military and quasi-military life, but it varied from intelligence work in East Africa and Palestine—the episode of the dropped haversack is well described here by the author and executant of the plot—to the Peace Conference in Paris, and included a good deal of hand-to-hand fighting which this staff officer took as part of the day's work. Intelligence, unorthodoxy, and unbounded energy combined in Meinertzhagen to make a character which must have been a joy to some but equally a headache to others.

The diary, obviously undoctored, inevitably contains some repetitions and some contradictions, but it is spiced with not a little acid criticism. With most of this we can feel sympathy, though some of it is woolly, notably that about the Peace Conference in

Paris, where the sense of frustration must have been galling to one of his nature. This is a most stimulating book which, it is hoped, will induce the new reader to try his other two diaries and other works from his pen.

Military Uniforms of Britain and the Empire. By Major R. Money Barnes. (Seeley Service). 42s.

This new book by Major Barnes is much on the same lines as his previous work, for it is not strictly about uniform but is a mixture of information including some brief regimental histories, stories of weapons and their usage, and a few battle accounts. The secondary title is given as " 1742 [no reason is given for choosing this date] to the Present Times," but in several instances the text treats of earlier history, 1660 or even A.D. 43 in the case of the arrow-extractor used in the Roman Army.

Besides the Army, many police forces are illustrated. This is interesting, but with so much still to be said on military uniforms it is, perhaps, a pity to introduce so much extraneous material.

There are many illustrations, especially in colour, much larger than in the author's previous book, thus simplifying the study of detail, and the insertion of a number of back views is also an excellent point. The black and white pictures have an ingenious system of hatching to represent colours. Many of the illustrations owe their inspiration to plates in the *Journal of the Society for Army Historical Research*, though they are not always interpreted correctly. It is about the colonial troops that the most useful material emerges. The uniforms of the Irish Regiment of Canada, the Fiji Constabulary, and the K.A.R., circa 1915, are not readily found elsewhere. The book contains much of interest for the casual reader but the general layout seems to follow no particular system nor is it, in any group, comprehensive.

Model Soldiers. By John G. Garratt. (Seeley Service.) 42s.

The model soldiers in the title of this excellent work do not refer to military paragons to be emulated by the junior officer, but to those little tin and lead figures with which we all fought our first childhood battles. John Garratt traces the history of this symbolic toy from the Egyptian Middle Kingdom of 2,300 B.C. to the present day. His narrative is clear and well-informed ; it never degenerates into purely specialist analysis, instead at each stage of the complicated story the subject is connected with its military and cultural environment. Of particular interest to the members of this Institution is the discussion of the excellent dioramas—representations of battles—on view in the museum of the R.U.S.I. As befits a study on the lead soldier, the work is beautifully illustrated and produced, and in all respects it may be considered a model of its kind.

The Red Dragon: the story of the Royal Welch Fusiliers, 1919–1945. By Lieut.-Commander P. K. Kemp and John Graves. (Gale and Polden.) 30s.

This is a workmanlike and at the same time most readable record of the Regular, territorial, and new battalions of the Royal Welch Fusiliers in the late war, painstakingly compiled and lucidly set down. The difficulties confronting a regimental historian these days, who has to familiarize himself with many widely divergent theatres of war and with infantry battalions (such as these) converted into parachute and anti-tank regiments, are added to by the narrow choice of methods open to him of presenting his narrative. The authors are to be congratulated on the way they have surmounted them. They have produced a history which not only must be a great satisfaction to the Regiment but, in commenting on such things as, for instance, the defective Italian anti-malaria cream (which caused the whole of the 29th Independent Brigade Group to be classed unfit for three months after the capture of Madagascar) and the manner in which Captain Dryland (7th Battalion) was evacuated when wounded in the Reichswald fighting, commends itself to a wider circle of readers of this and of later generations.

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A FULL LIFE. By Lieut.-General Sir Brian Horrocks, K.C.B., K.B.E., D.S.O., M.C. (Collins, 1960.) 25s. Presented by the publishers. (See review in this JOURNAL.)

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ARMY DIARY, 1899–1926. By Colonel Richard Meinertzhagen, C.B.E., D.S.O. (Oliver and Boyd, 1960.) 35s. Presented by the publishers. (See review in this JOURNAL.)

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